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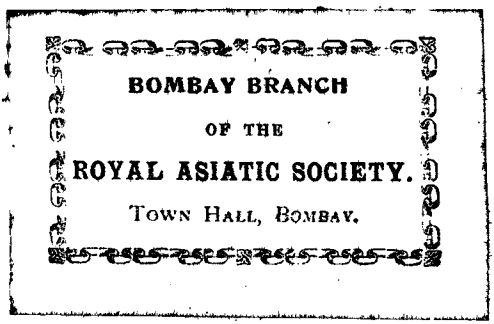

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Indian Amateur Gardener

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CALENDAR

FOR HILL-STATIONS & THE PLAINS OF INDIA.

It is necessary to remark here that though a calendar of garden operations is placed at the disposal of the perusers of this work, they are only suggestive, as no hard and fast rules can be laid down for the great length and breadth of the plains of India, or hill-stations from Darjeeling in the East, to Simla in the West, with all the intermediate elevations. Gardeners must make their own modification in which their good sense should guide them. There is almost a month of difference in the seasons between Lower Bengal and the North-West Provinces.

JANUARY.

IN HILL-STATIONS.

THE FLOWER GARDEN.—When the weather is clear the following operations should be carried on. All choice shrubs and plants should have their roots neatly protected with leaf mould, ashes or manure. Plant Crocuses, Snowdrops, Hyacinths, Anemones, Ranunculus, Tulips, and protect the beds with the covering before mentioned or litter of any non-conducting sort. All hardy bulbs should be planted now. Verbenas for propagation should be placed in a hot-bed heated from 80° to 90°. Place Dahlias in hot-beds to secure cuttings from them. Put Geranium cuttings singly in 48*s*. pots (uprights), and flowering Verbenas in 60*s*. flats. Make sowings of Gloxinias and Gesneras. Water all plants sparingly and with care in case of frost, and then water in the morning, not in

the evening. Petunias, Cinerarias and Primulas sown late in autumn will be ready to handle, and should be pricked out and potted off singly in small pots. Old plants of Primula sinensis will be in flower now; give them waterings of liquid manure in a weak solution weekly. They are quite a charm now when no flowers are to be got, and quite brighten up the conservatory. Some of your Geraniums (Zonals) will be in flower if your conservatory is a warm one.

THE VEGETABLE GARDEN.—Much of the gardener's success depends on his judgment now. Too much ground should not be covered, so as to admit of successive sowings, and for the main crops later on. Peas and Beans may be sown now in the open ground where the elevation is not too great, and cold not too intense, and under the same circumstances Radishes, Lettuces, Cabbages, Cape broccoli, and Cauliflowers may be sown in bottom heat, also Carrots and Potatoes. Parsley and Celery may also be sown in boxes or pots in small quantities for early planting out. Judgment must be exercised as to the advisability of sowing now. If the weather is too cold, the seed may lie dormant in the soil. If you be in doubt, the best plan is to make small sowings in boxes, which should be kept under protection in dull weather.

IN THE PLAINS.

THE FLOWER GARDEN.—Roses require surface dressing, and prune Allamandas, Hibiscuses, Ixoras, Jasminums, Lagerstrœmias, Lantanas, Nyctanthes, Quisqualis, and all Chrysanthemums which have done flowering should be taken up, shaken, divided, and planted in nursery beds. Your last sowing of Candytuft, Mignonette, French Marigolds, Nasturtiums, and Convolvulus may be made now, but these will not be so fine as your early sowings. Seedlings of former sowings will be ready now if they were not so before this, and should be pricked out and planted in the beds or pots you wish them finally to flower

in. Cuttings may be struck now of Heliotrope, Geraniums, sweet scented Verbena, and flowering Verbena, and from old plants of Pansies. Root cuttings of Chrysanthemums may be made now from plants which have done flowering. These should be three or four inches long from plump roots, and should be placed singly in small thimble pots. Ornamental foliage plants, such as Dracænas, Panax, Crotons, should be syringed twice or three times a day, between six and three o'clock, but not later, as a fall in temperature destroys foliage.

THE VEGETABLE GARDEN.—More free watering will be required in this month, and occasionally use liquid manure to all vegetables, especially Beet, Squash, Turnips, and Radishes. For succession sow Radishes, Mustard, Cress, Lettuces, and Spinach. Sow Peas for succession of early varieties. Plant out seedlings of Cauliflowers, Cabbages, Knol-Khol, and Celery; some of the latter being already planted out, should be earthed up.

FEBRUARY.

IN HILL-STATIONS.

THE FLOWER GARDEN.—Dig the flower beds and shrubbery occasionally, and beds containing Crocuses and Snowdrops, etc., should have the surface broken up by raking occasionally. Re-arrange, circumscribe and divide herbaceous plants. The old way of arranging them according to their heights is effective, the smallest being in front, the larger plants behind them. Activity must be displayed now and for the next three months, for much which has to fill the garden must be furnished now. Plants propagated now flower as well as those propagated in autumn, with the exception of Geraniums and Calceolarias: these latter grow as freely, but flower less abundantly than autumn struck cuttings. Old Geraniums should be gradually exposed and placed in bottom heat, and more cuttings may be put down

if necessary. Top dress Auriculas and Pinks; re-pot Pansies which are intended to bloom in pots, 8 inch pots (sixteens) will do, and are about the size that should be used, so that they may not require shifting, ensuring good bloom. Plant Gladiolus, Anemones, divisions of roots of Primrose and Polyanthus. Transplant layers and pipings of Carnation and Picotee, divisions of Campanula, Lobelia, Dianthus, Sinensis and Mulpink. Make small sowings of annual flower seeds, also Auricula and Primula, all in mild bottom heat. As soon as the plants appear, place the pots or boxes in an airy, light situation. Transplant former sowings of plants, but be careful of the weather, and if it be not fine, defer transplanting, or the plants may damp off.

Primula Sinensis is yet in full flower and will require liquid manure (weak) once a week.

Fumigate Cinerarias, which are so liable to greenfly and thrip. Spray the leaves with sulphur powder on the first appearance of mildew, and your plants will be healthy and strong, repaying you when in bloom with a mass of most lovely flowers.

Calceolarias grown from seed should be potted on, that is, put in larger pots as necessary. Pelargoniums will be growing now.

THE VEGETABLE GARDEN.—In open weather make small sowings of Radishes in beds, and Cabbages, Cauliflowers, Broccoli, Knol-Khol and Brussels Sprouts in boxes or pots under cover if at high altitudes, in beds if at elevations not exceeding say 3,000 feet. Continue manuring so as to have the land ready prepared a week or two beforehand. Cauliflowers, etc., should be protected from any severe weather, and dusted with lime or ashes occasionally to destroy insects and slugs. Earth up Peas to strengthen and protect them. Sow more Beans for succession, also Parsley, Carrots, Onion, Leek, Beet, Salad, and Pot Herbs.

IN THE PLAINS.

THE FLOWER GARDEN.—Surface dress, re-plant or re-pot Arums, Cyrtopera, Hibiscus, Manettia, Gloriosa Caladiums, and all tuberous, bulbous or fibrous-rooted plants that have been lying dormant during the cold season. Plant out late seedlings of Phloxes, Petunias, Pinks, Salpiglossis: layer Roses and re-pot Orchids: re-pot Hoyas: sow Poinciana and Tecoma seeds. Your plants will begin to require much more water as the west winds set in at the close of this month, and it must be attended to morning and evening.

THE VEGETABLE GARDEN.—Little can be done but watering well all vegetables, and making sowings of Lettuce. Mustard and Cress.

MARCH.

IN HILL-STATIONS.

THE FLOWER GARDEN.—Prune Roses. Sow grass seeds for lawns. Fork, rake and dig beds, borders and shrubberies. Complete pruning of Clematis, Bignonia, Jasmines and Creepers, and give the garden a neat appearance. Plant hardy Gladioli. Plant in pots the large flowering tuberous-rooted Begonias as soon as the weather is warming up. It is too early for starting the bedding varieties yet. Sow Flos Adonis, Calandrinia, Calliopsis, Campanula, Centaurea, Chrysanthemum, Clarkia, Collinsia, Convolvulus-minor, Erysimum, Larkspur, Linum, Amaranthus, Lupins, Œnothera, Poppies, Saponaria, Sweet-peas, Venus' Looking-glass, Veronica, Virginia Stock, Viscaria, Pentstemon, Foxglove, China Aster, but half-hardy annuals are perhaps better left till the following month. Pot off all bedding plants and keep them close for a week or more. Increase Dahlias by cuttings, this is the best month for it. Place Carnations in blooming pots, they will soon flower now.

THE VEGETABLE GARDEN.—Most of the principal crops must be got in now. Manure, trench and dig the soil deep. Devise a plan of how your garden is to be laid out and economise space. It is a little too early for Celery sowing in the open ground. Jerusalem Artichokes should be planted now, and Globe Artichokes should have their offsets taken off. Sow Carrots, Cabbages, Cauliflowers, Broccoli, Radishes and Peas, the early dwarf kinds first, and successive sowings later on as the month advances. French Beans should be sown at the end of this month.

IN THE PLAINS.

THE FLOWER GARDEN.—Gradually let Dahlias and Oxalis die down by withholding water. If Gloxinias, Richardia and Lilium have done flowering, withhold water and let them die down, and leave them as they are in the pots. Cut back shrubs that have done flowering, and take up Verbenas in pots to protect from the severe hot weather and rain which will fall in May. Watering must be carefully attended to, especially where hot winds prevail in Behar, Upper Bengal, and the North-West Provinces.

THE VEGETABLE GARDEN.—Onions, if perfectly dry, may be taken up now, if not, then next month. Carrots and Beet may be taken up now and stored in sand, or it may be deferred to next month. Vegetables yet in growth will all require careful watering.

In the North-West, Cucumbers and Squash may be sown now. Top dress Asparagus beds. Dry the leaves of Pot Herbs, and store them in stoppered bottles.

APRIL.

IN HILL-STATIONS.

THE FLOWER GARDEN.—All annual plants intended to flower in summer should be sown now. Another sowing of hardy

annuals should be made where they are to remain, such as Sweet-peas, Mignonette, Lupin, Poppy, Lychnis, etc.

Stocks may be sown now, and Biennials and Perennials transplanted. Sow Pansy and Heartsease. Propagate by cuttings Erythrina-crista-galli and Laurifolia. Bud Roses, and prune Roses not pruned last month. Prick in tender annuals to three or four inches apart in a fresh hot-bed, or thin them out. This is the best time to sow half-hardy annuals. All annuals grown from good fresh seed should germinate freely, especially when covered over with a mat until the plants are well up: but the mat must not lie on the sown bed, and should be high enough off it not to exclude light and free circulation of air. Begonias of the tuberous-rooted flowering varieties, if they have not sprouted last month, will be coming up now, and should be planted in pots, and bedding descriptions should also be either planted out in the beds, or better, planted into pots, and then later on planted in the beds they have to occupy. When the sun is powerful as it is now, they will require to be shaded till the rains set in fairly. The soil they are planted in should largely consist of leaf mould.

The Vegetable Garden.—Sow Indian Corn now of imported American varieties, but they will require to be watered regularly. Jerusalem Artichokes may yet be planted out, and plant offsets of Globe Artichokes. Sow Parsley and Spinach, and plant Potatoes for main crop. Sow Turnips, Carrots, Cabbages, Cauliflower, Knol-Khol, Parsley, Peas and Lettuce, Marjoram, Savory and Thyme: the last three when heavy rains set in will require to be sheltered, and it is therefore best to have some planted in boxes from earlier sowings and also some in boxes now. One or two more sowings of Peas may be made. Transplant Tomatoes sown last month.

Liquid manure may now be applied to half developed plants of the Brassica tribe, and to Peas, Beans, Lettuce.

IN THE PLAINS.

THE FLOWER GARDEN.—Store all bulbous plants, the leaves of which have died down. Plant Achimenes in shallow pans or ring-pots, and water well. Tacsonia and Passifloreæ may be pruned now of almost all last year's growth. Chrysanthemums may require a shift now to larger pots, and cuttings may yet be struck.

THE VEGETABLE GARDEN.—Very little can be done now, but water well such vegetables as may remain, and Asparagus; the latter plants require copious watering and manure dug in round them, or liquid manure. Little remains to be done, except the clearing off of crops reaped.

MAY.

IN HILL-STATIONS.

THE FLOWER GARDEN.—Continue to stock the flower garden with annuals you have already got. Thin such plants as Phloxes, Asters, etc., which send up too many shoots, so as to strengthen those that remain. Plant Hollyhocks for late blooming. Plant out hardy annuals first. Such bulbs as require removal should be taken up. Those that have been left in the ground for two or three years should certainly be shifted, they will be the better for it. Shift half-hardy annuals to beds where they are to remain, care being taken to move a lot of earth with them, but tender annuals should only be shifted to another hot-bed. Hardy annuals, Lupins, Adonis, Mignonette, Lychnis, and the like, may yet be sown in patches. The garden should be in good trim. Anemones, Ranunculus and Hyacinths should be in flower in most hill-gardens. Dahlias should be planted out of their pots, and Auriculas going out of bloom placed in shade. Put up sticks and supports to Carnations and Picotees in pots. Plant out Pansies which may be beginning to flower or be in bud now Dahlias and Hollyhocks, if requiring stakes, should be attended to as they advance in growth, or they will be blown over.

Water such plants as are in bud or bloom with liquid manure. Begin putting Chrysanthemums in their pots for flowering, this being their final shift.

THE VEGETABLE GARDEN.—New plantations of Asparagus may yet be made; stir the earth round Artichokes; divide Rhubarb and plant four feet apart, and sow some Rhubarb seed. Pinch off the tops of horse-radish going to seed. Sow some more Beans. Prick out Celery to six inches in a shady bed. Hoe Carrots and sow some more. Thin out Leeks and Parsnips. Hoe Turnips and sow more. Sow Parsley, Lettuce and Endive. Water with liquid manure half developed plants of Brassica, Peas, Beans and Lettuce. It will force them on. Sow Indian Corn again of American varieties for succession and keep the plants watered.

IN THE PLAINS.

THE FLOWER GARDEN.—Little can be done, but water the flower garden well in the evening and early morning.

THE VEGETABLE GARDEN.—Plant Jerusalem Artichokes. Sow Indian Corn, Brinjals, Squash, Vegetable Marrow, Cucumber, Okra, and the several varieties of native Spinach and native Vegetables generally, which will come in most handy when you have nothing else to fall back on in the way of English Vegetables.

JUNE.

IN HILL-STATIONS.

THE FLOWER GARDEN.—Propagate Lobelias from off-shoots. Fill up failures, which should be carefully watched for. Make pipings of Pinks, Carnations and Picotees. Stake Roses and destroy imperfect buds. Bud Roses. Save seed of the best varieties of annuals. Hollyhocks will be growing fast. Cut off side growth and propagate from them. Water freely when

the weather is dry. Chrysanthemums will now require to be put into their blooming pots, that is, receive their final potting. If intended for show flowers, one, two, or three shoots (the strongest) should be left to each plant and all others pinched off. Rose cuttings may be put down at the close of this month in shade, but not under the drip of trees, which should be avoided.

THE VEGETABLE GARDEN.—Well water the garden now. Clean Asparagus beds of weeds if the weather is dry. Peas and Beans may be sown yet. Finally plant out all Celery. Thin out Carrots to six inches apart or more. Thin out Onions and plant Leeks in deep drills for earthing up. Sow a little Lettuce and Endive. Plant out Vegetable Marrows, Pumpkins, Capsicums and Tomatoes. Sow Cress. Broccoli can scarcely be sown later than this. Plant Borecole, Brussels Sprouts and Savoys between rows of Peas, which will soon be taken up. Plant out Cabbages and Cauliflowers; a succession is important.

IN THE PLAINS.

THE FLOWER GARDEN.—Potted plants should be taken into shelter from rain, which may be heavy at the close of this month. Cuttings may now be taken of many flower and foliage plants.

THE VEGETABLE GARDEN.—Sow Maize and country Vegetables; European Vegetables having gone out by last month at the latest.

JULY.

IN HILL-STATIONS.

THE FLOWER GARDEN.—Plant out Hollyhocks in the garden and on lawns. Peg down plants intended to be kept dwarf. Propagate by cuttings, Roses, Chinese Azaleas, Myrtles,

Fuchsias and Pelargoniums, and layer Carnations in sandy soil. Regulate supplies of water to Geraniums; the air is full of moisture, and by watering too freely, the plants would throw all their vigor into growth, and flower sparingly. Chrysanthemums should all be in their blooming pots, and be growing vigorously. Do not water them with liquid manure till they come into bud in August or September, and their pots are full of roots. Cuttings of Hydrangeas should be put down now and they will strike freely. Fertilize Pinks to ensure good seed. Water Carnations, Pinks, Roses, etc., with liquid manure. Sow a few annual seeds to bloom in September. Bud Roses.

THE VEGETABLE GARDEN.—Hoe Asparagus frequently. Pull up early crops of Beans, those that are bearing should be watered in dry weather; and put up sticks for Runner Beans. Sowings may be made yet of Runner Beans and Dwarf Beans. Water with liquid manure Brassica half grown and over half grown. Thin Beet. Any Celery left over should be planted out. Carrots, Turnips, Lettuce and Endive may be sown for late use. Train Tomatoes, and water them in dry weather. Plant out Broccoli, Brussels Sprouts, Cabbages and Savoys. Cabbages and Cauliflowers for late use may be sown yet. Pot Herbs may be taken up and dried for winter use, and Savoy and Sage propagated by cuttings. Sow Parsley for winter use.

IN THE PLAINS.

THE FLOWER GARDEN.—Nothing is done in the flower garden till the end of this month, when Balsams and Zinnias should be sown, also Amaranthus, Calonyction, Cockscomb, Carthamus, Martynia-diandra, Ipomœa, Rubro-cœrulea, Quamoclit, Nicandra, Spilanthes and Sunflowers. Should Dahlia bulbs which have been stored, be found to have sprouted, pot them, and also Gloxinias. Put down cuttings of Roses and tropical plants. Bud Roses.

THE VEGETABLE GARDEN.—In the vegetable garden little can be done but sowing native Vegetables, and earthing up Jerusalem Artichokes, Turmeric, Arrowroot, and Ginger. Sow in boxes a *little* Cauliflower, Brinjal, Okra and Cucumber, to be transplanted later on. Hoe up the ground well during this month, and the two following months on clear days.

AUGUST.

IN HILL-STATIONS.

THE FLOWER GARDEN.—The garden should be very beautiful now and everything kept very neat; dead flowers picked; turf, gravel and edging cleaned thoroughly. Water Roses with liquid manure to insure good blooms. Propagate plants of the delicate Pelargonium varieties to establish them before winter. Propagate Lantanas, Hydrangeas, Mesembryanthemums, Petunias, Verbenas, Salvias, Lobelias, and Calceolarias. Sow seed of Ten-week Stock, Intermediate Stock, and Brompton Stock, to be kept in pots through winter, in sheltered situations. In gentle heat sow Mimulus, Petunias and Larkspurs. Make cuttings of Antirrhinum, Pentstemon, Gentian, etc. Plant out recently struck Pinks, Wallflowers and Pansies, retaining a few of the latter in pots for protection during winter. Re-pot such Geraniums as may have done flowering. Plant autumnal bulbs such as Narcissus, Colchicums, Guernsey Lilies and Amaryllis, in the borders, beds and pots, in sandy soil. Layer Picotees, Pinks and Carnations. Stake Hollyhocks. Richardia æthiopica should now be divided and re-potted in the richest compost; they will yield a quantity of flower at the close of the year and through winter.

Water Chrysanthemums well; they must not be stinted of it now.

THE VEGETABLE GARDEN.—Cut Artichokes down after gathering the heads, and fork the roots; they will come up

again. Clean Asparagus beds. Pull up old Bean-haulms. Stop Runner Beans, which will set quicker. Sow a few Cabbages and Cauliflowers. Earth up Celery. Transplant Leeks. Sow Lettuce. Take up Onions. Stir up soil round Parsnips, and pull up Pea-haulms.

IN THE PLAINS.

THE FLOWER GARDEN.—Bud Roses, and propagate many choice plants by cuttings which are very successful during this month, such as Panax, Eranthemums, Acalypha, Aralias and Crotons. Cuttings of Gardenias, Ixoras and Hibiscus strike readily now. Layerings of such climbing plants as Antignon, Bignonias, Cissus, Stephanotis, Allamandas and Bougainvilleas will all take, and some may be taken by cuttings. Lay in a stock of leaf mould and sand for sowings to be made in September and October.

THE VEGETABLE GARDEN.—Make small sowings of Cabbages, Knol-Khol and Cauliflowers in boxes so as to protect them from rain. Celery and Asparagus should be also sown now, and sow the small varieties of Tomatoes. Fruit trees can be budded now successfully. It is too early to sow seed in the open ground, which is too humid, and all that can be done is to hoe and prepare the garden.

SEPTEMBER.

IN HILL-STATIONS.

THE FLOWER GARDEN.—All Verbenas, Ageratums, Geraniums and Calceolarias, should be trimmed to fine sharp lines; edges clearly defined; and fill in vacancies with the trimmings. Plant Crocus, Snowdrop and Tulip bulbs. Propagate Roses, Heliotrope, Salvias, Petunias, Geraniums, Calceolarias, etc., by cuttings. Take up Geraniums that have done flowering, shake out the roots and re-pot; after

a time cut them back to low buds conveniently placed; the same operations may be carried out with Campanulas of good varieties. Insure growth in Pelargoniums: on it depends profuse bloom. Water more sparingly. Chrysanthemums will be in bud and the pots full of roots; water them once or twice a week with liquid manure. On show plants leave only one or two buds to a shoot; for decoration, more buds may be left; but even then a great many must be taken off, probably a half of the number on each shoot. Tie up flower stalks. Stir up the soil in the pots frequently to prevent its getting sour. The drainage of the pots should be perfect to get good blooms. The plants must be watered copiously at least twice a day. They must not want for water now or it will be fatal to the perfection of blooms. Narcissus may be planted out yet, and these will bloom before winter sets in.

THE VEGETABLE GARDEN.—Earth up Celery, and transplant such sowings as were made in July and August. Cauliflowers may yet be sown in some hill-stations, and Cauliflower and Cabbage plants sown in May will be ready for planting out. Broccoli may be sown to stand the winter. Plant out winter greens and Brussels Sprouts. Sow Lettuces, Cress, Turnip-radishes, Carrots and Turnips in small quantities. Onions of the Welsh and Strasbourg varieties can be sown at the beginning of the month.

IN THE PLAINS.

THE FLOWER GARDEN.—Make sowings of Heartsease, Pansies, German Asters, Cinerarias, Balsams, and Zinnias. Richardia œthiopica and Oxalis will now require to be potted and exposed to light. Prune Rose trees. Most annuals can be sown now or in October.

THE VEGETABLE GARDEN.—Sow the main crop of Cauli-flowers, Cabbages, Brussels Sprouts, Knol-Khol and Arti-chokes. Sow a little Pea-seed and Beans, but, if rain falls, it

is liable to destroy the sowings. To get early crops you must take your chance. Sowings of all seeds should be made on raised beds. Prepare the garden by repeated ploughing.

OCTOBER.

IN HILL-STATIONS.

THE FLOWER GARDEN.—Should now be planted with Tulip, Crocus, Snowdrop, Hyacinth, Anemone roots and bulbs. Hyacinths in pots should be plunged in a cold bed to the rim of the pot, and covered with a cone of paper till they are well up. Pot roots of choice varieties of Hollyhocks and Pansies. Plant out seedlings and cuttings of Pansies in a good light soil. Pot Persian Cyclamen in a compost of loam, sand and leaf mould. Take up Geraniums and Pelargoniums (after having cut them down a couple of weeks previously), plunge the pots in bottom heat, and by so doing you will ensure autumnal growth, which is the great secret of securing future profuse bloom. Protect Fuchsias. Take up Dahlias. Plant Narcissus to flower before winter sets in if you are not at too high an elevation. It is late to do so in Simla and Mussoorie in the open border. Make sowings of Cineraria, Pansy, Calceolaria, Mignonette and hardy annuals in boxes, to be kept under cover for spring flowering. Sweet Peas may be sown for spring flowering in open beds and must be protected with straw during winter, after which they will repay you well. Sow Primula, Sinensis and Japonica in pots or boxes. It is getting late to make cuttings of Pelargoniums now, but Geraniums will strike well yet. The former will strike yet, but make little growth before winter sets in, and will not be large enough to flower well in spring. All your Chrysanthemums should have been staked last month, if not, do not delay in doing so now. The early flowering varieties so popular as decorative varieties will be in flower now. Continue to give

liquid manure once or twice a week to all Chrysanthemums. Dry off Achimines and Caladium bulbs.

THE VEGETABLE GARDEN.—Earth up Celery as often as necessary. Store Carrots, Potatoes and Parsnips. Sow early Peas an inch and-a-half deep. Prick out Cauliflowers sown in August, and transplant Cabbages, Broccoli, etc. Lettuces for spring may be pricked out under a frame (the hardier kinds are best for this purpose). Radishes and Cress may be sown *if the weather is mild.*

IN THE PLAINS.

THE FLOWER GARDEN.—This is the best time to get imported bulbs, and the best time to pot them is just on arrival. The garden requires a thorough cleaning-up and repair. Paths and lawns must be looked to, and in all departments it must be made a busy time. Plant Narcissus and Daffodil bulbs. In the N.-W. Provinces and Punjab they do very well. Almost all English annuals are to be sown now, *except Nemophila* and *Larkspur*, which are better sown either at the very end of this month or in November. Re-pot all bulbs and water carefully. Plant out Verbenas. Re-pot Carnations and Picotees and most pot plants: so you will see there is a very great deal to be done this month. If you have time, bud Roses; but you will be very busy indeed.

THE VEGETABLE GARDEN.—This is the safest month to secure a sowing for the main crop of almost all European Vegetables. Peas and Beans of all sorts should be sown weekly, as also Lettuces every two or three weeks. Sow Turnips, Carrots, Tomatoes, Cabbages, Cauliflowers, Knol-Khol, Artichokes, Beet, Radishes, Mustard, Cress, Salsify and Endive, early in the month. Plant out all seedlings in the open, in beds; or, in their places (according to size), Cauliflowers and Cabbages.

NOVEMBER.

IN HILL-STATIONS.

THE FLOWER GARDEN.—Remove decaying foliage and keep the beds clean. The leaves collected for leaf-mould should now be placed in pits or some out-of-the-way place. Pot, and afterwards cut back, Lobelias and Œnothera. Lophospermum, Maurandyas and Tropæolums require a dry and airy place in a glazed verandah, frame, or green-house. A few bulbs should be planted. Protect Fuchsias, and allow Auriculas plenty of air. Pot layerings of Carnations and Picotees. Take up Dahlia bulbs and keep them in a dry and airy place. Pot off Pansies to fill future vacancies and for spring flowering. Stir up soil round Polyanthuses. All Tulip bulbs should be planted now and protected in the beds. Take up tuburous Begonia bulbs, and store them away in dry soil or sand.

All plants requiring protection will have to be attended to now and in December.

THE VEGETABLE GARDEN.—Dress Asparagus beds with manure and cut them down. Surface dress Artichokes. Peas and Beans may be sown and protected in winter. Runner Beans will have done bearing and must be taken up. Finally earth up Celery; besides blanching, it protects it. Take up Beet, Carrots and Onions, and store them. Earth up Leeks, and use them as required. Hoe Turnips. Tie up some Cabbage-lettuces to blanch them. Stir soil round Cabbages and Cauliflowers, Brussels Sprouts, Broccoli and Savoys, and remove dead leaves. Some late varieties of Cabbage and Cauliflower may be sown early in the month, and kept over for spring use, and must be protected during winter.

IN THE PLAINS.

THE FLOWER GARDEN.—Put down cuttings of Roses and other plants. Make sowings now of Nemophila and

Larkspur. Transplant such annuals as may be strong enough, and such as benefit by transplanting about the end of this month.

THE VEGETABLE GARDEN.—All European Vegetables should be sown weekly or every two weeks for succession. Stick Peas. Plant out Cauliflowers, Cabbages and Knol-Khols, and earth up Potatoes. Transplant Mint to fresh beds well manured. Plough or deeply dig all vacant spaces in the vegetable garden, more especially fields to be occupied by Cabbages and Cauliflowers, having previously manured them.

DECEMBER.

IN HILL-STATIONS.

THE FLOWER GARDEN.—Collect leaves and all rubbish and sweepings in a pit for leaf-mould. Keep gravel walks clean, so that even in winter it will be cheerful and comfortable. Protect the annuals which have to stand in beds. Protect and watch bulbs from inroads of rats, mice, etc. Sawdust is a good protection. You might begin at the very end of this month to force a few Dahlias by plunging them in pots in a protected frame or hot-bed. Fork soil in bed and borders. Pot Begonias and place them away, after they have died down, in a dry room or out-house. Tulips planted last month will be peeping out now. Ribbon borders may be planted of this bulb only, as follows, beginning with the front of the bed:—white Tulip, red, yellow, scarlet; or blue Crocus or yellow, scarlet, white, blue; or blue, white, red, yellow, scarlet, white; but this can only be done at high elevations with Tulips with any degree of success. Tulips are very stunted and do not flower well at low elevations. All plants should be protected out of doors with straw tied over them and manure, leaves or sawdust at their roots, especially soft wooded plants like Brugmansia, which are sure to suffer.

THE VEGETABLE GARDEN.—You should think of what seeds you require; get them in hermetically-sealed tins from America, England or Scotland, to arrive about this time, or procure them from respectable Florists in India. Force Rhubarb thus: put a pot over a bunch of crowns so as to sufficiently cover them, and cover it with dung prepared to keep up a moderate heat. Cover to a thickness of three feet from the ground, or cover the pot with leaves as some gardeners do, only it harbours insects and is not so good as dung. Cover Celery with straw and blanch Endive.

IN THE PLAINS.

THE FLOWER GARDEN.—Gesnera, Sprekelia and Arum should be allowed to die down by withholding water. Make cuttings of Heliotropes, Verbenas, Aloysias, Carnations and Habrothamnus. Pansy, Cineraria, German Aster and Geranium seedlings will require to be re-potted.

THE VEGETABLE GARDEN.—Further re-sowings should be made of all English Vegetables, but it is rather late now for the Cabbage, Cauliflower and Knol-Khol; but Peas, Beans, Lettuce, Cress, Mustard and Radishes should be sown. Celery, Radishes, Asparagus and Squash require good waterings.

RIBBON GARDENING

OR RIBBON PLANTING.

This style of gardening is not generally adopted by amateurs with any great degree of success in India, and indeed we do not recommend it, as it is necessary to have a considerable amount of knowledge and experience, so as to have all the different plants in flower at the same time. The beds, too, soon become bare of flowers at certain seasons, and cannot be filled. The stiff formal geometrical figures are somewhat against it, to say the least; but certainly in season there is a great show of brilliant coloring.

We simply give an example of how it can be accomplished, and we recommend one class of plants being used at a time in the arrangements, such as Phlox Drummondi, of different colors, or Petunias. Or Phloxes and Petunias, yellow being represented by pot Marigolds. The following is an arrangement of Mr. John Caie's, who occupied a high position as a gardener of the greatest taste, and it is applicable to India in hill-stations or the plains, substituting such plants as are above mentioned or any others that suggest themselves as applicable to the purpose as long as annuals can be grown. In the hills bulbs may be used, but with only a moderate amount of success at the best. Annuals are more easily managed both in the hills and plains for this purpose.

February and March.

1. Helleborus ruger—*white* and *pink*.
2. Beds of Crocus reticulatus—*blue*.
3. Eranthis hiemalis—*yellow*.
4. Galanthus plicatus—*white*.
5 Narcissus minor—*yellow*.
6. Erythronium Denis albifolium—*white*.
7. ——————Denis canis—*purple*.

April and May.

1. Anemone apennina—*blue*.
2. Arabis pracco—*white*.
3. Cherianthus alpinus—*yellow*.
4. Aubrietia purpurea—*lilac*.
5. Alyssum saxatile—*yellow*.
6. Iberis saxatile—*white*.

Hardy-annuals for April and May.

1. Silene pendula—*pink*.
2. Nemophila atomaria—*white*.
3. ——————insignis—*blue*.
4. Eschscholtzia crocea—*orange* and *yellow*.

5. Collinsia grandiflora—*blue-purple.*
6. ————bicolor—*white* and *lilac.*
7. Clarkia pulchella alba—*white.*

May to November.

1. Geranium Lucia rosea—*rose.*
2. Verbena, Princes Royal—*white.*
3. ————Heloïse—*dark lilac.*
4. ————White perfection—*white.*
5. ————Duc d'Aumale—*bluish.*
6. Calceolaria riscosissima—*yellow.*
7. Verbena, Robinson's defiance—*scarlet.*

The above should give a fair idea of what can be done in the way of bedding. Other and newer varieties may be substituted for ribbons; but, as mentioned before, the great objection to this style of gardening in India is that for a long period the beds would remain bare. If you are prepared to fill up the beds immediately they are empty, by all means try it, otherwise do not attempt it, as it may lead to your being much disappointed when you see a blank. It requires forethought, and a good stock of suitable flowers for succession.

CHAPTER I.

THE FLOWER GARDEN—INTRODUCTORY.

T has been remarked with much truth by one of the best gardeners in this country (the Rev. T. Firminger) that Horticulture has as yet made very little progress in India. Since then and even since the publication of this work, rapid progress has been made; so much so that I feel I must make some changes and additions to this the third edition: necessarily so when I may here mention that since 1872 over seven hundred popular varieties of plants have been introduced into India out of only a few genera Alocusias, Authuriums, Azalias, Begonias, Crotons, Dieffenbachias, Dracœnas, Marantus and Panax.

Native gentlemen of the richer class value plants of the better varieties, and spend much money in procuring them and take much interest in their cultivation; many of them have good gardens, while almost all, especially those living in country-places, make attempts more or less successful, in the same direction. Nursery gardens, especially those belonging to native gentlemen, are greatly on the increase in number as well as quality. An inspection of the Gardens of the Agricultural and Horticultural Society of India at Alipur, Calcutta, or the Botanical Gardens, Calcutta, the Government Botanical Gardens of Saharanpur, and several others would quickly convince one of the immense strides made in gardening of late years.

However, a great deal too much is left to the native gardener, who lays out the garden in the old methodic way by planting out rows of *Balsams*, *Marigolds*, and such other

plants he has a peculiar fancy for, except where the amateur is a zealous gardener in himself. Other plants, again, possessing religious virtues, such as *Ocimum*, *Sanctum* (called by *malis*, *Toolsee*), though growing as wild as weeds, are never uprooted, and thus cause the garden to look like a wilderness. Such traces of neglect are yet to be seen, but not so frequently as in former years.

I need hardly say that European gentlemen entrust their gardens largely to the gardeners; the majority take but little interest in them, perhaps on the principle of their tenancy being for a short time only. It is true that they have introduced new plants, but they have done little in the way of cultivating and improving them. Many delight in seeing plants well-grown, and flowering luxuriantly, and are anxious to obtain them from those who take an interest in their cultivation; yet, when they are procured, the plants are left entirely to the mercy of the *mali*, who takes as little trouble with the garden as his master does.

Few attempts have been made at hybridising in India, and what has been done, professional gardeners must almost exclusively have the credit of. It is well-known that the rarest and handsomest of our plants have been thus brought to perfection in England and the Continent of Europe. Whatever has been effected for Horticulture in India, has been chiefly effected by the importation of plants from foreign sources.

Native gentlemen at a more recent period and a few private European gentlemen have also imported plants. Some small native gardeners sell plants propagated by them, but these as a rule are of inferior sorts; and as regards roses, I may remark they not infrequently cheat their purchasers by attaching wrong names to them. I would therefore warn those who buy plants from *malis* to make sure that those they buy are the plants they profess to be, and that they are

well-rooted, for they are not infrequently without any roots at all. I do not intend that this remark should apply to some of the larger nurserymen. The native gardeners employed by gentlemen not infrequently soon acquire the names of plants, and as they gain experience soon learn the saleable value of them, and unfortunately many are the losses sustained through the nimble fingers of the deft *mali*, which should be guarded against. A good deal of this pilfering would, however, be stopped if purchasers only enquired who sold the plants they bought, and how the vendor came by them, *especially in the case of rare plants*, which native gardeners cannot get honestly.

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY

CHAPTER II.

SOILS AND MANURES.

HE gardener in this country has frequently, if not invariably, to take the soil just as he finds it, and the site of the garden is regulated by the site of the house. A good soil for the garden is an open porous variety, *not* too sandy, and even better if a little stiff. This sort of soil, with a little addition, would suit most plants, and injure few if any of the generality of those we grow in open beds. Red clayey soil is objectionable, but this defect can be remedied by manuring heavily with vegetable mould, with the addition of old horse-dung and sand. I will not add more on this subject, for according to the density of the clay, so should be its treatment. Manure is a most important factor in garden operations and deserves special attention. The theory of its uses will not be entered into here further than is necessary, but more its practical uses.

Soils.

Old cow-dung is, without doubt, a good manure for general use and for pot plants; it should have been collected in a pit, and regularly forked and turned over and kept in a moist condition. Very often it is thrown above the soil in a heap and exposed to rain, sun and air, the result being that it is worthless or nearly so. Cow manure is well adapted for applying to light soils. Its value is much enhanced in its being from grain-fed cattle. If pits in which manure is deposited, be kept with a covering over them, so much the better; this is as it should be; *but* every one will not go to this trouble. I must point to the necessity of doing this, as the manure loses much of its value if exposed at all. There should be

Manures.

a corner in every garden, where there is a manure pit, covered over with thatch, and hidden away by a hedge, so as not to be unsightly.

How to prevent larvæ and insects in manures, animal and vegetable.

In using most manures, the safest and best plan will be always to pour sufficient boiling hot water over them to saturate them, so as to kill all larvæ and insects which may lie concealed. After allowing the substance to dry moderately, mix it with the earth round the plant, or in the earth you are going to put your plant into, either in the pot, or in the open bed. Oilcake too is very energetic in its action and is a good manure for roses and for making compost for other plants. It should be broken up into small pieces and mixed with water, and allowed to decompose first before being used. Wood ashes and cow-dung ashes are stimulating to the growth of plants, which will be clearly seen by the deep dark-green hue and large leaves which plants nourished by them produce. Care, however, should be taken to use them, especially wood ashes, *moderately*, for if applied largely, it is sure to do harm, whereas a small quantity will go a long way in serving the purpose sought for. Ashes of wood are one of the most valuable manures.

Oilcake a manure.

Ashes.

Sheep's dung, night-soil, and pig's dung.

Sheep's dung is of little use unless when employed well mashed and broken up. Night-soil and pig's dung, though no doubt they would be excellent, cannot be used, as native *malis* will not be induced to touch them.

The use of Guano as sown, or used as a liquid manure.

Guano, *sparingly* used, is a most useful manure, but it requires to be applied with the utmost caution, and only in very small quantities, and I think is best in a liquid form, half an ounce to a gallon of water. When sown, it should be

mixed with five times its weight of earth, and wood or cow-dung ashes, and then scattered as thinly as possible.

Liquid manure of any sort.

When liquid manure of *any* sort is used, it should be *perfectly clear and weak*, and be applied only when plants are in vigorous growth, when plants are in bud, or when plants in pots have the pots full of roots, and it is desired to force them to flower.

Soap suds useful in washing the leaves and stems of plants.

Soap suds are useful for washing the leaves of plants with, and I cannot speak too highly of them, especially when applied to pot plants which are liable to collect dust; besides, they prevent insects attacking the leaves, and are a preventative against blight. Firminger says, "From my own little experience with Orchids in the vicinity of Calcutta, I have had reason to believe this mode of treatment to be one of the main secrets of success in cultivating them," and many must know this from practical experience among orchid growers. It applies to every vicinity in India, mostly so to towns where smoke and dust abound.

Stable litter and horse-dung.

Stable litter is useful, but very powerful, and liable to burn plants if not *thoroughly rotten*. If used let it be thrown into a pit and forked every few days, never let it dry up. Moisten it, don't flood it, then fork it, and you will find it excellent, for stiff soils especially. It is most useful as a liquid manure, and being full of ammonia, is useful for Chrysanthemums in bud.

Ashes.

Ashes are useful as a manure: but much of it depends what the ashes are made from, as regards strength, and therefore they must be used carefully. Cow-dung burnt yields capital ash for general use: wood ash is also good, but must be used more sparingly, and coal ash is of less value than either.

Soot.

Soot is useful as a manure, and when applied to soil infested by earthworms, kills or expels them. It is excellent applied to pots and does much good to nearly all plants. As you will not be able to get at earthworms in pots easily, apply it as liquid manure, and they will come to the surface from which they can be picked off without any difficulty. Applied to Chrysanthemums, it expels earthworms, which are often engendered through the heavy and rich manuring they receive.

Leaf mould.

Leaf mould is a most useful and a safe manure. This should be carefully collected in covered pits in all gardens. It gives to plants the organic manures in a fit state for them to take up as food and supply them with nourishment. It is beneficial as an addition to stiff soils.

Green manure.

Green manure is a powerful stimulating substance, rather dangerous in amateur hands, and should be used with the greatest caution in the vegetable garden only. By green manure is meant vegetable substances turned into the soil, and which, when thoroughly incorporated with the soil, aid in the liberation of mineral ingredients, which do much benefit to crops. The roots of plants exert a great influence in decomposing it, and causes it to throw out great heat, which makes it give up to them the elements they require.

Lime.

Lime is a beneficial manure both as quicklime and air slaked lime. Stiff and cold soil is benefitted by the application of either. Light soils should be supplied with air slaked lime, and it is always best in applying to give it in small quantities, so as to keep it near the surface and in an active state.

Charcoal.

Charcoal is most useful when mixed with the manure heap, as it absorbs ammonia largely, and when applied to plants supplies them with it as well as with oxygen, which it also absorbs in a less

degree. The application of it also assists drainage, and so is most useful, especially when added with manure in which it has been placed, and mixed with compost for pot plants.

Bone dust and bone meal or phosphate of lime.

Bone dust and bone meal are safe and useful manures, but should be chiefly mixed in the lower strata of soil so as to be allowed to decompose there slowly. The good effects of it are gradual, as it takes some time to be in a fit state for the plant to take up, especially bone meal, which is larger than bone dust and takes longer to decompose. This manure is chiefly oxide of calcium combined with phosphoric acid, which makes phosphate of lime. Bones dissolved in sulphuric acid is sulpho-phosphate of lime, which supplies phosphorous and oxygen in combination, and also sulphur; each of which are most beneficial and necessary to the fertility of the soil.

Sewage.

An immense quantity of valuable manure is wasted in our towns, in the sewage which is carted away daily. This, if applied to gardens, would supply the inorganic food they require.

It must be remembered that plants derive their nourishment from the inorganic substances or elements in the soil and organic substances from the atmosphere. It is therefore the inorganic substances we have to look for with which to prepare the soil for plant life.

Sweepings of the poultry house and pigeon cot.

Sweepings of the poultry house and yard and of the pigeon house is a most powerful and useful manure, and is a very concentrated manure approaching in value Guano, *if kept dry*, and not exposed to sun and rain, then powdered and applied as liquid manure, or mixed with dry earth and distributed over the soil. I would recommend the former method for pot plants and the latter for the open ground.

Common salt.

Common salt is unquestionably a valuable fertilizer, and it is a pity it is not more generally known to gardeners. A small quantity of it scattered broadcast over land, has a most beneficial effect; also added to the compost made for pot plants exerts an influence that no other manure can produce, but it must be used in small quantities.

Economy, and how to use some manures.

Seeing how most of us have to buy manure in some form or other for our gardens, it is very necessary that we should have all leaves, ashes, and such refuse as we can collect, gathered, and placed in the manure pit. Generally the sweepings of the fowl and pigeon house are thrown away, and this is one of the most valuable manures. These last mentioned manures, namely, from the fowl house, pigeon house, and wood ashes, are most concentrated manures. Coal ashes are not so useful. Soot will also be found an excellent fertilizer. To mix it with water, is considered difficult, but that can easily be done by placing with it a stone or brick, and tying up the whole in a piece of cloth and sinking it in water, which will then make a concentrated liquid manure, a little of which can be added to the watering can of water in such proportion as you consider correct. In this, nothing will guide you better than experience.

Liquid manure controllable in its action, and the safest for amateurs.

Not infrequently amateurs, and for the matter of that professional gardeners too, make the mistake of manuring soils too highly, and when once this is done the mistake cannot be readily corrected. It is decidedly far safer and better not to make this error of judgment, but to err on the other hand, by manuring perhaps slightly too little; after which *it is left to you to apply liquid manure which is quite controllable in its action.* Now is this not a boon in the gardener's hands if he only keeps his eyes open to the effects it produces? First apply the liquid manure, of whatever substance it may

be composed, in a weak form, so that its effects are not too sudden. Apply it weak and frequently, even daily. Let it be clear, that is, not muddy, or containing the solid portions of cow-dung or stable manure, which would clog and clot the surface of the soil, and prevent it getting down to the roots of the plant, besides excluding air, causing the soil to get sour.

Provided then that you supply the liquid manure weak and clear, you have an inestimable boon, *which all amateurs should in no way neglect;* and, as I strongly recommend, give up heavily manuring the soil, especially of your pot plants. The result will be, you will meet with success where probably you have been haunted with repeated failures, which may have, indeed must have disgusted you.

When liquid manure should be applied, and under what conditions.

I must point out to you when liquid manure should be applied. Perhaps you may think you know all about it; yet I would advise you to read these remarks, as you may not be too old or too wise to learn something from the remark just at present being placed before you. All of us should know crude manure, and rich manuring of the soil, causes an exuberant excess of foliage and wood, at the expense of flowers. Liquid manuring being entirely controllable, any lesser effect may be produced as the amateur or professional gardener desires. So when wood and foliage is desired, liquid manure should be supplied as soon as the leaf buds begin to develop. If flowers of a superior type are required, it should be applied when the flower buds are showing *and beginning to swell.* It then causes the flowers to be larger, especially so when some of the flower buds are nipped off when too many are on the plant, and the flower is intended for exhibition. In such case, not only are the flowers larger in all their parts to make up a larger flower on the whole, but the colors are improved and more brilliant. But one precaution must be taken, which is, you must not apply the liquid manure too soon before the buds begin to swell.

Liquid manure is excellent, applied to Zonal Geraniums, but the supply in this instance must be weak, moderate and continuous. To Roses, apply it stronger twice or even three times a week, when the buds are swelling. If for show flowers, dispense with some buds, and the same applies to Chrysanthemums, in which case only one or two buds must be left to each flowering stalk.

It will be seen from the above examples, how leaf can be produced and how flowers can be benefitted both in size and color. Decorative Chrysanthemums only require their buds trimmed out just as you desire. Yet for size sake some buds must be sacrificed.

Now let us see how liquid manure can be made beneficial to fruit trees, in the production of superior, well-flavoured and enlarged fruit. To apply it to fruit trees when they are in blossom, would be a mistake, probably it would improve the flowers, but the fruit would not set.

It should be applied when the fruit has set, and is beginning to swell; then it should be given *weak* and in quantities in accordance to the size of the tree. If given too strong it is liable to cause a prolific abundance of leaf, and instead of helping to improve fruit, aids leaf growth, which does more harm to the fruit than good.

The method of applying liquid manure to fruit trees.

The best method of applying liquid manure to fruit trees, is by taking a crowbar, and making holes all round in the soil at about where the extremities of the roots or rootlets would be, some distance from the stem of the tree, and into these pouring the liquid manure.

The holes will require to be of some depth in accordance with the size of the tree (say ordinarily a foot to a foot and a half deep and two to three feet apart, using a crowbar or stake of wood two or three inches in diameter).

Fill these holes with the fluid in weak solution, and it is obvious that very much less liquid is lost by evaporation, than if you had applied it on the surface of the soil, and it will penetrate deeper.

When to withhold liquid manure.

Liquid manure must be withheld when the fruit begins to mature, or it will be watery and insipid, though large in size, and perhaps well-colored if situated on the tree so as to obtain the full rays of the sun.

The strength liquid manure should be applied to fruit trees.

Perhaps the only difficulty experienced will be to judge of the strength in which to apply liquid manure, so it is better that some guide should be given. Guano may be used as follows, 6 lbs. of Guano to a hogshead of water after it has been allowed to lie for two or three days.

Thirty-seven seers of horse manure or sheep's manure (well broken and mashed up), or half that amount of soot (wrapped in a cloth with a stone or brick in it to sink it), or about eighteen seers of fowl house manure to a hogshead of water would be the proportion which, when applied clear, will be found beneficial.

ARTIFICIAL MANURES.

During these modern days of improvement, when the horticultural field is flooded with plant novelties, and alike beset with appliances to assist the growth of them, we must keep our eyes open to such artificial manures as are beneficial, for some are only puffed and popularized by innumerable testimonials, though they are more or less useless. Through this labyrinth of trouble, I am persuaded to try and guide the amateur, I will therefore mention a few of the fertilizers known to be of efficacy in rearing plants to perfection in India for flower, foliage and fruit.

At the same time I would recommend very strongly the use of fertilizers in the form of liquid manure especially, as in such case, I have stated before, they are quite controllable in action, and at the beck of your will to produce flower, leaf or fruit of superior quality. Would that amateurs would believe this, and instead of loading the composts made by them for the plants in their garden and in pots with crude manure, use some of the artificial fertilizers mentioned below in a liquid form, or even mixed with the compost in a solid state. Generally any manure is thought good enough, this is quite an erroneous way of thinking, for in *most* instances it is not prepared at all, but only thrown in a heap exposed to the action of sun and rain, and filled with a mass of insect life and fungoid growths exceedingly harassing and even deadly to plants.

I therefore am obliged to say it is far preferable to employ artificial manures instead of cow or stable manures such as are used by those who do not know how to prepare them, or who buy them from natives, or even Europeans for the matter of that, who have no interest whatever in your garden and pot plants, and how they grow.

You must not, however, run away with the idea that artificial fertilizers will be successful in your hands, unless you use them with judgment, even though many of the pests which infest the ordinary manures will be avoided.

They must be used as directed. All of these fertilizers are accompanied with directions how to use them, which are enclosed with the tin or bag they are sold with.

Ichthemic Guano.

Ichthemic Guano is a preparation of Guano, which is highly recommended for all purposes for which fertilizers are necessary; and is therefore a good all round commodity. It may be used as a surface dressing dug into the soil one to two ounces to the

square yard of ground. Or it may be employed most beneficially in a liquid state, a tablespoonful to a gallon of water; *but in the case of pot plants*, a tablespoonful to three gallons of water will be sufficient. Another method of using it is by mixing it for compost, 1 part of Ichthemic Guano to 100 parts of soil.

It may be used at all times throughout the year for roses. For Chrysanthemums, mix it in the compost for final potting, and use it when the buds begin to swell, as a liquid manure twice or three times a week.

It is useful in a liquid form for Geraniums, Violets, Ferns and Primulas; and for fruit and vegetables one or two ounces to the square yard. For lawn grass, mix with an equal quantity of soil and scatter this compost evenly three or four ounces to the square yard.

You will soon be convinced of the great value of this manure. It can be obtained from the Manager, Himalayan Seed Stores, Barlowganj, Mussoorie, North-West Provinces, India, as may also many of the other fertilizers mentioned below, such as Standen's manure, which is also excellent.

The cheapest is Ichthemic Guano, which is sold in enamelled tins at As. 8 and Re. 1, or in 7 ℔ bags at Rs. 4, 14 ℔ at Rs. 7, 28 ℔ at Rs. 12. The bags are sealed so as not to be tampered with by the home vendors.

Standen's Manure.

Standen's manure is particularly useful for liquid manure and otherwise for pot plants, and Vines benefit much by its application. This is a finely ground powder with little or no smell, and is highly concentrated, the smallest quantity giving results of a satisfactory nature. It is most cleanly in its use, and is rich in phosphates soluble, and insoluble, nitrogen which is equal to ammonia to nearly 11 per cent., and alkaline salts, constituting it a most valuable plant food.

Cannell's Real Manure.

Cannell's Real Manure is well known in England, though less so here; it is a very concentrated excellent fertilizer. For potting, one ounce to a bushel of compost; for liquid manure, half an ounce to a gallon of water, increasing the strength and quantity till the plants are in full flower.

Dobbie's Fertilizing Compound.

Dobbie's Fertilizing Compound is another excellent manure very concentrated, and is excellent for all purposes either pot, border or field. Clay's is another manure which is good and worthy of mention. Many other manures may be mentioned, but let it suffice that the amateur may content himself with these of known quality, especially Ichthemic Guano, which can be got from the Himalayan Seed Stores, or Standen's Manure; these will suit for all purposes.

CHAPTER III.

POTS, PRELIMINARY OPERATIONS, ETC.

Pots, Ring-pots and Pans—for what purposes they are constructed.

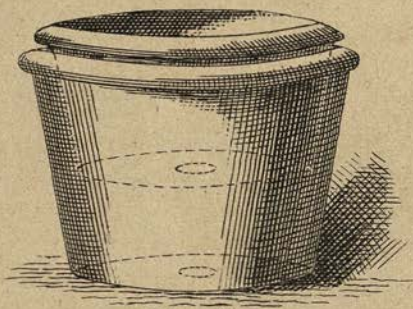
POTS are made of many shapes, and then again there are *Pans*, or, in other words, shallow pots broader than they are deep; and *Ring-pots*, or one pot inside another. Pans are made for the purpose of facilitating drainage and for growing plants in groups so as to show masses of flower, which would otherwise be lost to view as being insignificant singly, but very pretty when *en masse*. Ring-pots are constructed for the purpose of filling in the interspace between the pots with sand or other material, to prevent, as far as possible, radiation and evaporation from producing sudden changes of temperature.

The professional English gardener classifies his pots as below, beginning at—

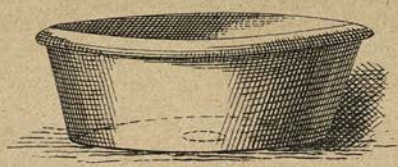
"Thimbles"—the smallest size.							
"Sixties"—	3½	inches	deep,	3½	inches	broad	at the top.
"Forty-eights"—	4½	„	„	4½	„	„	
"Thirty-twos"—	5½	„	„	5½	„	„	
"Twenty-fours"—	6½	„	„	6½	„	„	
"Sixteens"—	8	„	„	7½	„	„	
"Twelves"—	8½	„	„	8½	„	„	
"Eights"—	9	„	„	9	„	„	
"Sixes"—	10	„	„	10	„	„	
"Fours"—	11	„	„	11	„	„	
"Twos"—	12	„	„	12	„	„	

It must be remembered that these dimensions vary considerably as regards "Flats" and "Uprights," the former being

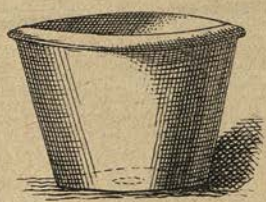
Plate I.



Ring Pot.



Flat Pot.



Upright Pot.

Litho. & Printed by W. Newman & Co., Calcutta.

of greater diameter than depth, and the latter being of greater depth than diameter; but each being made to hold as nearly as possible the same quantity of soil. That is to say, an "Upright Two" would contain as much soil as a "Flat Two," and an "Upright Four" as a "Flat Four," and so on. It is necessary to know this, as you will not infrequently have to consult books other than those published for this country.

Potting plants and re-potting plants.

Certain plants grow best in pots; others again are grown in them for the sake of ornament. Soak all *new pots* in water well before using them, and old pots should be well washed both outside and inside till they are perfectly clean. See that every pot has a hole for drainage at its bottom before using it (I have seen this neglected, which is ignorance indeed, or carelessness in leaving everything to native gardeners), then fill one-fourth of its depth with charcoal or crocks, after that spread a small quantity of cocoanut fibre over it, and put a little earth in the pot, then the plant should be held over the centre of it, so that the roots may be spread out over the compost, or if it is a tap-rooted plant, see that the tap roots just rests on the compost, then fill in the remainder of the earth, well pulverised, so as to fill within a short distance from the top of the pot, and press the soil down firmly. The plant being planted in most cases a little deeper in the soil than it was before. In some cases such as Primulas, &c., they have to be planted just up to the collar, but these instances are noted when the plants are referred to. Firm potting or pressing down of the earth moderately, is very necessary to attend to.

Plants that require pruning and re-potting should not have both operations done at one time; prune first, and when the plant is just starting into growth, it should be re-potted. When it is desirable to increase the size of a plant, and its roots have filled up the pot it inhabits, it should be removed to a larger sized pot; when the roots have filled the pot, they will appear at the hole in the bottom. But this

should not be hastily done, as very often plants are the better for being root bound, and some which will not flower readily will now do so, if liquid manure be applied. The plant can be easily removed from one pot to another by inverting the pot while the hands are laid on the surface soil, then tapping the top of the pot against the handle of a kodali placed erect. In this way a ball of earth is preserved round the plant, of which as much as desired can be removed by tapping the ball gently without destroying the rootlets.

Soil for pot plants.

Different plants require different soils, either lighter or stiffer as the case may be; but the following will be found a fair method of making good compost for plants in general:—An excellent method of preparing soil for tender annuals, and choice plants, is thus described in an old book on gardening, and I may add I have tried it with good results. "Take turf and lay it in a ridge 18 inches wide at the bottom, three feet high, and any desired length." If the turf is only two or three inches high, so much the better, dig up earth and all. "Take fresh stable manure, which is to be used in making the hot-bed, *before* it has been turned, and lay it equally round and over the turf. If there is plenty of manure in proportion to the turf, the latter may easily be heated to 200 degrees, which will destroy all insects, roots, herbage, etc., and wonderfully enrich the soil by the distillation of gas evolved from the manure during its fermentation. The manure must be turned once or twice while on the ridge to fit it for the hot-bed. When ready, make up the bed, and remove the turf to a shed or airy spot to dry, when it is ready for use. This is the very best soil for annuals, but when put into pots, should be mixed with a little vegetable mould and some sand. In the season, turf may be prepared by covering with short grass from mowings, though this is inferior. By the former process it is ready in ten days. Only prepare the soil required for one season's sowing and transplanting." Avoid composts

of too rich a nature, and depend on surface dressing, and liquid manure when necessary.

A little charcoal mixed in compost aids drainage, and is in other ways useful.

Watering potted plants.

Great mistakes are made in watering potted plants by treating them to large quantities of it at once, or perhaps, in the opposite extreme, by withholding water from them for days. By heavy watering the soil becomes sodden, and by allowing the soil to dry the young rootlets are destroyed; the life of the plant is endangered by either method, therefore, if water is given in small quantities and more frequently, a safer plan is adopted by those who are careful and do not know exactly what quantity of water a plant requires, for some require more and some less water than others. By putting potted plants out in rain *for a few minutes only* they derive much benefit; care being taken they are not left out too long. Some, however, are of delicate structure, and are laid flat, and much battered by it. Watering should only be done in the morning and evening; and only in the morning when the weather is frosty and cold at night, in the hills especially.

Plants standing in their pots placed close together thrive better than when placed far apart. They shade each other and save evaporation to some extent. Otherwise pots plunged in sand or soil, or ashes, thrive better. It obviates many evils. In other cases one pot may be placed in another and larger pot, the space between being filled with sawdust, ashes or sand, to prevent evaporation and radiation.

Great mistakes are made in potting plants by gardeners, who are very fond of planting them in pots far too large. They should be gradually potted on, from one size to the next, which is called "potting on." Native gardeners have little idea (or I may say no idea) of potting plants on; and Europeans make the same error, thinking it quite sufficient that plants should have lots of pot room, and a good compost to grow in.

ON THE POT CULTURE OF PLANTS.

A few remarks on the pot culture of plants may be found useful to some novices in that art of gardening, for this style of cultivation is so essential to towns, and is so much practised in India, and not infrequently so many mistakes are made that even the hardier plants thrive indifferently. I need hardly remark that a plant in robust health is a thing of beauty, whereas a badly grown plant is simply an apology for not having one at all.

These faults chiefly come about by the entire work being left to the native gardener. In the first place, drainage is essential, there must be a hole at the bottom of the pot used (I have even seen this overlooked, ridiculous as it may seem). The careful potting of plants is most important; after having selected one not too large for the plant to be grown in it, cover the hole at the bottom with a slightly-curved bit of potsherd; then arrange more potsherd irregularly over it, till about one-fourth of the pot is filled; over this arrange a little refuse of cocoanut coir, or moss which is perhaps better; and above this, place the compost most fitted for the plants to be grown in it. On each article on plants will be found the description of compost suited to them. The above applies to upright pots: flat pots, or pans as they are sometimes called, require less potsherd.

It must be remembered that a certain quantity of soil is consumed in the form of nourishment by the plant, while other portions are washed away in the drainage; therefore it is necessary to re-pot plants once, twice, or even three times a year, even should they not have outgrown the size of the pot. Sometimes, however, surface-dressing is resorted to, that is, a portion of the surface-soil is removed and replaced with fresh rich compost. Several varieties of plants are much improved by being watered with liquid manure once or twice a week, taking care that it does not touch the leaves; also that the manure used is old, and the water when taken

off the manure is clear. In some instances such as in that of geranium plants, they improve by being to a certain degree pot bound, and then being supplied with liquid manure, and are forced into flower. Some native gardeners are in the habit of over-watering plants to save themselves the trouble of watering them so frequently; nothing is so harmful perhaps as this, as the soil soon gets sodden and sour. Should any plant have been left unwatered for a long period, previously having been over-watered, and the soil at the bottom of the pot has grown sodden and impervious, it is best to stand the same, up to its rim nearly, in a tub of water for half an hour.

A most important point is not infrequently overlooked, and that is, that some delicate plants, those with fleshy roots especially, such as Begonias, &c., suffer extremely from radiation: these should be grown in ring-pots, or one pot placed in another, the interspace being filled with moss, cocoanut coir, refuse, or earth. Otherwise the pot may be let into the soil, in a hole *rather deeper*, but of the same circumference as the pot itself, the space at the bottom allowing free drainage for the water allowed the plant. This is called plunging.

I believe that tubs or wooden pots, though less durable, are far better to grow plants in than earthen vessels, being bad conductors of heat or cold. I have seen geraniums for instance, grown in a verandah in Darjeeling, some in earthen pots, others in wooden tubs: the latter being splendid large robust plants with the finest trusses of bloom, while the former were not half the size, nor bore nearly such fine flowers. The climate of the hills being most variable, I consider the above statement will show how conclusive this deduction is, that wooden tubs, or boxes, ornamentally, are much to be preferred to earthenware for growing plants (especially of the more delicate varieties).

The grouping or arrangement of different varieties of plants in separate pots must be considered according to their

heights, color of flowers, and variegation of foliage, so as to be most pleasing to the eye.

In towns where dust and dirt accumulates rapidly on the leaves, not only should the syringe be used freely after the sun has gone down, and in the early morning, but the leaves should be occasionally wiped gently with a soft sponge or rag, dipped in soap-suds and water, if it is found necessary.

Care should always be taken never to water plants while the soil and leaves are yet warm from the effects of the sun. Should any plant be drooping for want of moisture, it is best to remove it into shade for an hour or so, till it cools, and then to water it, and after a time to return it to its original place.

Generally speaking, it is best to use liquid manure when the buds are swelling. There is such a variety of plants, all of which can be grown in pots, that the list that might be drawn out of the same would be simply endless. No house in any town need be without its plants as ornaments, in the portico, window, verandah, or on the table. What can there be more beautiful and becoming than a well-grown plant let into an ornamental pot placed on the centre of a table, or a few of them thus placed at a window! Occasionally, the plants grown as ornaments in a room should be changed, and replaced by others, as well to admit of their keeping in a healthy condition, as to give variety and change to the eye; for it is admitted, variety is charming, and even the most charming plant will lose its attraction by being ever before the always present beholder and resident of the house. Plants that have been kept to ornament a room in the day-time will be much refreshed by being put out in the open at night. I feel confident that if the above directions be carried out generally, the amateur should not fear failure with the pot-culture of even some of the most delicate plants.

Below is a short list of plants that may be grown most successfully in pots, tubs, or ornamental wooden boxes.

Note.—Those marked thus* are prostrate or erect plants.
Those marked † are bulbs.
Those marked ‡ are climbers.

* *Abutilon* of varieties.
† *Achimenes* of sorts.
‡ *Æschynanthus.*
* *Aloysia Citriodora.*
* *Authuriums & Alocasias.*
† *Arum Pictum, Richardia Ethiopica, & other arums.*
* *Arystasia.*
* *Azaleas.*
* † *Begonias* of sorts.
* *Bletia.*
† *Caladiums* of sorts.
* *Chrysanthemums* of sorts.
† *Cipura.*
* *Cissus Discolor.*
† *Crinums* of sorts.
‡ *Clerodendron* of sorts.
‡ *Clitoria.*
‡ *Cobœa Scandens.*
* *Crotons* of sorts, of which there are many new varieties.
† *Dahlias* of sorts.
* *Dieffenbachias.*
* *Dracœnas.*
† *Eucharis Amazonica*
* *Euphorbia Jacquiniflora.*
* *Ferns* of sorts.
* *Franciscea.*
* *Fuchsias* of sorts.
* *Geraniums.*
* *Gesnera.*
† *Gladiolus* of sorts.
† *Gloxinias.*

* *Habrothamnus.*
† *Hoyas* of sorts.
* *Hydrangeas* of sorts.
† *Hippeastrum.*
† *Iris* and *Ixia.*
* *Jatropha.*
* *Jasminum.*
* *Lemonia Spectabilis.*
‡ *Lophospermum Scandens.*
† *Lilium Longifolum* and other *Liliums.*
* *Magnolia Pumila.*
* *Manettia Cordifolia.*
‡ *Maurandya.*
* *Olea Fragrans.*
* *Orchids* of some sorts.
† *Oxalis* of sorts.
‡ *Passiflora* of sorts.
* *Panax.*
† *Pancratium.*
* *Pentas Carnea.*
* *Rondeletia Punicea.*
* *Salvia* of sorts.
‡ *Stephanotis,* of which there are new varieties.
* *Tetranema Mexicana.*
* *Torenia.*
‡ *Thunbergia.*
* *Verbena (Aloysia Citridora)* and the prostrate flowering varieties.

All pot plants should be tallied or labelled neatly, and by so doing, you will soon learn the names of your plants, and be able to recognise their varieties at sight. It lends a charm to have them correctly and neatly tallied. For this purpose, Chandler's patent indestructible labels are about the best thing of the sort I have seen; they are made of five various forms, but it is sufficient to say here, that they are either to

stick into the soil, or to tie on the plant with wire. The name of the plant or tree is written or indented on the label, easily and legibly, with a lead pencil or pointed stick, *pressing a little heavily* and holding the label on the flat surface of a pocket book.

The inscription made is imperishable, and when the label is old and dirty, is easily cleaned by simply putting it into a hot fire.

A little white lead rubbed with the finger over the label and then wiped off with a rag, will leave a deposit of white lead in the indentations, making the name conspicuous.

These labels are cheap, and cost about 8 annas to 12 annas a dozen ; and if bought by the gross, from 5 rupees to 8 rupees. They may be got at the Himalayan Seed Stores, Barlowganj, Mussoorie ; and I strongly recommend them, especially for places where white ants are destructive, and also for the hills, where there are heavy rains, and wooden labels are soon rotted and the writing on them defaced.

Another most efficacious accessory may be had at the Seed Stores above mentioned, namely, the Lethorion patent vapour cone, which is a splendid insect destroyer. It is perfectly safe, and will not injure the most delicate plant, but is certain death to all insect life. The price per cone, sufficient to fumigate 500 cubic feet, is one rupee. The mode of using them is to close the room to be fumigated, remove the wrapper over the cone, and light it on the top with a piece of live charcoal fire or a match.

If a room for the purpose be not convenient, a tent of quiltings may be placed over the plants to be fumigated.

Tobacco paper or dust is not so efficacious as this, though in some cases the dust or powder is more conveniently employed. Tobacco paper, rags, and sheets are used for fumigating. Fir tree oil is used for spraying plants with when diluted,

and is a good insecticide. The directions for use are sold with it, and I will not enter into the subject here.

Abbreviated list of errors made with pot plants and remedies.

1. Insufficient drainage. Fill one fourth of your pots with crocks.

2. Don't use large quantities of manure. Turfy loam is best; or any ordinary soil, to which, if stiff, add a little old leaf mould, and silver sand or sweepings of roads, and mix some broken charcoal, the size of peas or beans, and a small quantity of cow manure, old and well prepared. Guano is better, and with it the ova of insects is avoided.

3. Have your soil coarse, not fine like powder, or water will not penetrate through it, and your plants will suffer from drought.

4. Press the soil down in potting, moderately firm, with the palm of the hand or a small flat board, and don't leave it loose.

5. Don't flood with water, but water frequently and in moderate quantities. It is sufficient that all the soil in the pot be saturated. If water is supplied in excess, it simply drains out, and carries with it the virtues of the soil and food in it for the plant. When the pot is full of roots, liquid manure may be freely and frequently applied.

If too much foliage is shown on flowering plants, either stop the use of liquid manure entirely, or use it seldom, and then weak as your judgment will direct.

6. *Pot your plants on gradually;* that is, do not put them into much larger pots than they were previously in; probably the next larger size is the best.

CHAPTER IV.

MODERN FLOWER GARDENS.

Ribbon-gardening: a word for and against it.

N this subject it is as difficult for the writer to suit the ideas of every one as it is for the cook to satisfy the palate of every gourmand: however, I will venture to say, ribbon-gardening banishes from our sight many a lovely floral beauty, which was withal a lasting beauty, while the flowers, generally annuals, sown or planted in geometrical figures, though exceedingly pretty, and unsurpassed during their blooming season, when they have done flowering, leave the beds barren and with a look of forsakenness that I cannot think is compensated for by their once great beauty and gorgeousness. Yet for those whose ire I may evoke by penning these lines, I will show how they may employ ribbon-gardening so as to please the most fastidious of modern gardeners who follow out the method. Whatever I may have stated with regard to this system of gardening, I have not one word to say against the popular flowers; they are all beautiful in their way, and deserve the attention and care bestowed on them. The care with which they have been cultivated has produced most beautiful Petunias, Verbenas and Geraniums, worthy of the degree of florist's flowers.

Pansies, Dahlias, etc., have hardly excelled their originals in a greater degree than the Geraniums and bulbous or flowering Begonias of the present day have improved on theirs, and thus almost the entire popular attention has been diverted to the latter, often unfortunately to the exclusion of old favorites.

A great many perennials have perished in the march of fashion, which is to be regretted.

I would, therefore, say that though bedding plants should by no means be given up, yet that only a circumscribed space may be allotted to them, and this would be certainly a step in the interest of floriculture. This applies chiefly to large gardens, as both systems could not be carried on together in gardens of limited extent.

Ribbon-gardening: as it should be carried out as regards beds.

Whatever be the shape of the beds, they should slope *uniformly* from the centre. The centres, I think, are all the better for being a little raised. See figures of forms of beds (as regards outline). The raising of the centres will require judgment, and must not be carried to too great an extent, as rain and water washes the earth down and makes them unsightly, and the plants become unhealthy from having their roots bared.

Ribbon-gardening: the flowers and plants requisite to form ribbons.

Bulbs, flowering shrubs, herbaceous plants and annuals are required to a large extent. Bulbs will not be required in the plains, nor do they flourish satisfactorily (they are better in pots), though they do well on the hills, especially Crocus, Snowdrop, Daffodils, Narcissus and Tulips. At home they are largely used to decorate the spring garden. In the plains of India, Phloxes of different colors, planted in ribbons, make a beautiful show alone, unmixed with annuals of any other sort, and there are a large assortment of them procurable from seedsmen in England and Scotland, and in Calcutta and Mussoorie also, from large seedsmen's stores, such as the Himalayan Seed Stores, Mussoorie, where each variety may be got separately, and whose seeds I generally recommend as being reliable, well selected, and obtainable in each variety. Again, Antirrhinums, Lobelias, Stocks, Verbenas, Petunias, and Geraniums of varieties, form splendid ribbons for hill-stations, and

these few flowers can surpass; also Perilla Nankinensis and Coleus of sorts. Calceolaria pinnata, Lobelia, Delphinium, Calendula, Candytuft, Asters, Petunias and a great number of annuals do as well in the plains as in hill-stations; but in the former, Delphinium must be sown late to insure its germinating. From these and many other annuals may be selected plants that flower at the same time, or may be made to do so by regulating the time of sowing, and the colors of each ribbon matched to the cultivator's liking. Each packet of seed should be procured labelled, stating the color of the flower, so as to save future disappointment; between each bed there should be grass to show off the colors effectively. [See frontispiece shewing favorite arrangements of colors.]

The mixed garden: how it should be planted out.

Many permanent objects may be placed in the mixed garden with advantage, such as ornamental and flowering shrubs as a background, with smaller plants in front, pillars and arches of creepers, each having its own peculiar beauty. Roses freely planted along the edges of water-courses flourish luxuriantly. Myrtles, Oleanders, Gardenias, Poinsettias, Chrysanthemums, all find a place there, care being taken to arrange the plants in accordance with their respective height, the smaller plants in front and the larger behind them in correct order. Lawns and tanks may be introduced, and fountains, etc., in accordance with the amount of land, and funds at disposal for outlay.

Exposed places are well protected by trellises covered with creepers, Poivrea cocinea, Solanums, Bignonias and Tecomas of sorts, etc., etc., all hardy and bearing the sun well.

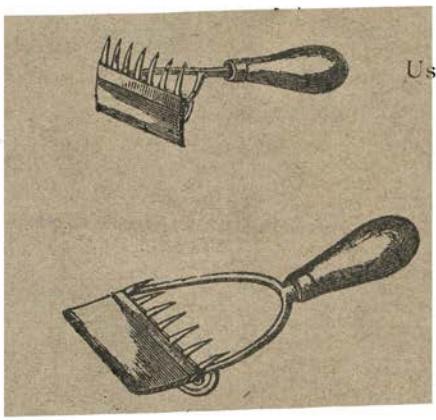
Rockeries and Ferneries: where to construct them.

A shady corner near a tank in a garden is a good place for rockeries or ferneries. Wherever they may be placed, there should be at least some amount of shade, and the more uneven the ground, so much the more picturesque they will be. Cork and stone should be used for the ferneries, forming

crannies and nooks as the resting place of plants, and in rockeries large blocks of stones interspersed with smaller ones, avoiding all formality. Arbors and seats of various designs may be placed here and there. The roof of the arbor may be thatched or made of boards or of corrugated iron, and the sides of trellis work made of wood or bamboo, or strong galvanised wire, which is cheap, as well as more lasting than the two before-mentioned materials. Climbers of perennial growth should be made to grow over the arbor, and be well-trimmed and trained to grow close to the trellis work.

Implements for *malis*.

The *mali*, or native gardener, cannot be induced to give up his "khoorpee" and "kodali"; however, they are not bad instruments, though very primitive. I would insist, notwithstanding, on the use of the rake, and there is a little instrument of which I give an illustration which is readily taken into use by a native: it combines a hoe, rake and khoorpee, all in one, by reversing the blade, which is rotatory. It may be procured from Messrs. T. E. Thomson & Co., Calcutta, or any other firm.



Used as a Rake or Hoe.

Used as a "Khoorpee."

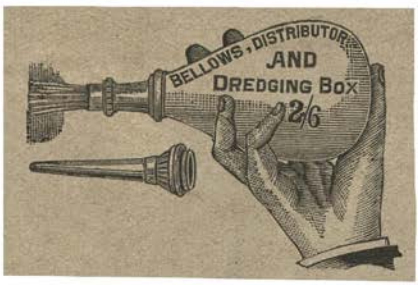
Scissors, too, are necessary, also a hedge clipper and a budding knife. Each of these are made of many different forms, and the purchaser can suit his own requirements as to their forms and adaptability. A dibber can be made anywhere

when a carpenter is procurable, as below, and will be found useful in planting out vegetable and flower seedlings.

In the hills coolies take readily to the use of the fork, and there is no better implement for turning up the soil effectively. I consider it much better for general purposes of digging or loosening the soil than the spade or "kodali."

The syringe is a necessary implement which in hot weather you will find most useful, and for spraying insecticides.

"*The Duplex*" powder distributor and dredger is useful in using "Thanotos," Tobacco Powder, Sulphur, Helleborne, etc., for the destruction of insect life, and you will waste less of the insecticide by adopting it.



Conservatories and grasshouses.

Conservatories and grasshouses are adjuncts of ornament and value, affording an unending source of study and amusement, and may be attached to the house. A southern aspect is the best and most suitable.

Grasshouses.

In the plains, grasshouses, similar in construction to the betel-leaf houses used by natives for the cultivation of the betel-creeper, make an excellent conservatory for Orchids and other tender plants which cannot bear the direct rays of the sun. For those who have not the opportunity of seeing a grasshouse, I will describe it briefly. It may be constructed of any form adapted to the ground it is intended to occupy. Construct the sides with reed grass, pretty thickly placed between bamboos, split and placed on both sides of the reeds; the sides should then be erected and attached to poles at the corners of the building; the roof should be flat, and should be made of the same material, the reeds being sparingly used, so as to admit of some degree of solar light, but not to prevent rain coming through, and rather only to prevent the heavy falling of its drops directly on the plants to be placed within, and to afford a partial shade. Poles of bamboo will be required to support the roof, should the house be of any extent. Such houses are invaluable for the growth of a variety of plants which cannot bear the direct rays of the sun on their delicate leaves and flowers, and can be well furnished with Dracænas, Crotons, Palms of sorts, and Orchids, etc., etc.

CHAPTER V.

ABOUT BEDS, AND ON THE ARRANGEMENT AND HARMONY OF COLOR IN RIBBON BORDERS, ETC.

T is not sufficient to have a well formed garden, it must be well filled, and the color of the flowers it is stocked with, must so harmonize as to produce the best effect. All colors are more or less beautiful in themselves, but when placed in relationship or contiguity with others, they either destroy, blend, or intensify each other: hence it is necessary to arrange the colors after some general principle.

The reserve garden is supposed to furnish the amateur with the necessary stock of flowers, and I proceed first to describe the forms of beds, and after that the arrangement and harmony of colors.

BASKET BEDS.—These formed on lawns are very effective and highly ornamental. They are constructed with a base of wood, brick, stone, iron, or turfed embankments generally having one or two rims turned over to convey the idea of a basket; the rims and handles being entwined with creeping plants, and even the baskets themselves being covered with Ivy, Ipomœa, Marandya, or some other climbing plant, and when the basket has two handles, the interior may be furnished with four colors, as described, placed transversely, thus—white, scarlet, blue, orange.

CROSS-SHAPED BEDS—Are also ornamental, and have the advantage of being easily designated by their proper names, such as the St. Andrew's Cross, Maltese Cross, the Latin Cross, etc.

LEAF-SHAPED BEDS.—These are made according to the shape of any natural leaf, and the amateur will find innumerable forms in nature which will provide him with exquisite designs.

PINCUSHION BEDS—Are so called from their having flowers of different colors dotted over them, such as red Geranium, dotted here and there in a bed of white Verbena, or Lobelia, Speciosa or Purple King Verbena, and the Scarlet Verbena Melindres dotted in it.

TILE BEDS—Are simply beds cut in a lawn and edged with red, white, or any fancy-colored tiles or bricks, circle within circle, of two, three, or more heights; the beds may be of any form, the tiles or bricks being used not only to edge them, but to form different tiers of heights, the centre being the highest, each tier containing a distinct color of flowers. In this way they are most effective.

TENT BEDS—Are formed by ropes, wires, or chains, thus—Place a pole of the desired height where the bed is to be made; round it form a circle, and in the line of the circle place pegs at equal distances; to these attach ropes, chains, or wires, and carry the other ends to the top of the pole, to which they must be securely fixed. In this way the frame is formed for a tent-bed, and over it are grown creeping plants of choice varieties.

THE HARMONY AND ARRANGEMENT OF COLORS—Must receive great consideration: I therefore add a few observations, which are generally recognised as correct by the artist as well as the gardener:—

1. Colors must be as nearly of the same *tone* as possible to produce the best effect, for "the complementary arrangement is superior to any other for harmony of contrast. White comes in best combination with blue and orange, and worst in combination with yellow and violet."

II. "The simple colors, red, yellow, and blue, combined in pairs, go together better than one simple color and one binary containing that simple one. For example:—red and yellow harmonize better than red and orange; red and blue better than red and violet; yellow and red better than yellow and orange; yellow and blue better than yellow and green; blue and red better than blue and violet; and blue and yellow better than blue and green."

III. "In an arrangement of one simple color with a binary color containing the simple one, the brighter the latter is, when compared with the former, the better the contrast; or in other words, in arrangements of this sort, the tone or intensity of the simple color ought to be lower than that of the binary color. For example:—red and violet contrast better than blue and violet; yellow and orange better than red and orange; and yellow and green better than blue and green."

IV. "When two colors harmonize badly, they had better be separated by something white."

V. "Black never produces a bad effect when combined with two bright colors. In such cases, indeed, it is often better than white, especially when separating the one color from the other. For example:—black produces a harmony of contrast with the following binary arrangements, *viz.*, red and orange, red and yellow, orange and yellow, orange and green, yellow and green."

VI. "Black associated with dark colors, such as blue and violet, or with bright colors with a deep tone, produces harmonies that often have a good effect. For example—an arrangement of black, blue, and violet is better than one of white, blue, violet, white, etc.; the latter being too violent."

VII. "Black with two colors, one bright and the other dark, is not so good as when the two colors are both light; and in the first case, the brighter one of the colors, the more the effect produced. Thus in the following arrangement black is inferior to white:—Red and blue; red and violet; orange and blue; orange and violet; yellow and blue; green and blue; green and violet. Lastly, with yellow and violet, if not inferior to white, black produces but a middling effect."

VIII. "Grey, with two luminous colors, though perhaps it does not produce a decidedly bad effect, makes the arrangement look flat, and is inferior to black or white. With red and orange, perhaps grey may be better than white; but it is inferior to it, as well as to black, when placed with red and green, red and yellow, orange and yellow, orange and green, or yellow and green; it is also inferior to white with yellow and blue."

IX. "Grey, associated with dark colors, such as blue and violet, and with bright colors of a deep tone, does not produce so good an effect as black in the same cases. If the colors do not look well together, it is better to separate them."

X. "Grey and two colors, one bright and the other dark, is better than white if the latter produces a contrast of too deep a tone, and better than black if the latter increases the proportion of dark colors too much. For example:—grey is better than black with green and violet, green and blue, orange and violet."

XI. "When two colors harmonize badly, they had better be separated by white, black, or grey; but in so doing, attention must be paid to the tone of the colors, and to the proportion of light and dark color. For example:—as to the tone of the colors the effect of white with red and orange

FRONTISPIECE.

Note.

RED or ROSE, Geranium, Verbena. &c.
YELLOW, Calceolaria, Nasturtium, Escholtzia, &c.
PURPLE, Verbena, Petunia, &c.
BLUE, Lobelia Nemophila.
WHITE, Candy Tuft, Verbena, Nemophila alba.
GREEN, Mignionette, or Ribbon Grass, &c.

Design for Ribbon Borders.

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is lessened in proportion as their tones are deepened. Black on the contrary does very well with the same colors at their normal tone; that is, when, without containing any black, they are intense as possible."

Lastly—"Grey is not so good as black, with red and orange, nor does it produce so violent a contrast as white."

These remarks, which I quote from a work which has many times proved valuable to me in regard to the choice of colors, I trust will prove of equal value to the reader either in gardening operations, or, if they meet the eyes of the gentler sex, will also shew how colors can be arranged with the greatest effect in working in crewel and other woollen work, with which they may test the correctness of the above statements.

Plants for Ribbon-borders.

The following is a list of plants that may be used for making ribbon-borders, which may be even composed of the most common plants:—Lobelia and Clintonia of sorts, Verbenas of sorts, Geraniums of sorts, Salvias, Coreopsises, Phloxes, Dahlias, Koniga, Petunias, Heliotropes, Lantanas, Ageratums, Gaillardias, Mirabilis, Hollyhocks, Stocks, Asters, Zinias, Sweet Peas, Pansies, Daisies, Primroses, Silene, Dianthuses, Cloves, Pinks, Picotees, Veronica, Campanulas, spring flowering bulbs, and late bulbs, such as Gladiolus and Lilies. Plants of ornamental foliage make a better show than many would imagine, planted in ribbons such as—1st, Arabis, a very hardy plant—2nd, Egyptian Beet with red leaves—3rd, Variegated Mint—4th, Perilla Nankinensis, an annual largely used for such purposes—5th, Atriplex Rubra. This example shows how simply such beds can be arranged: the smaller plants being in the front and graduating to the tallest in the centre of the beds.

CHAPTER VI.

-ROADS AND WALKS AND THE GENERAL LAYING OUT OF MIXED GARDEN-LAWNS.

IT is difficult to enter here as to how to lay out a garden. So much depends on the shape of the ground available that it would be quite out of the question to give any hard and fast rules for doing so.

Generally speaking, the flower garden and conservatory should be nearest the house as an ornament. The outside of a grass conservatory is not ornamental; and therefore should be hidden away by some screen of creeping plants on trellises, or of small trees which should not interfere with the sunlight and should not have their drip on it.

Lawns with beds cut out on them are, in a tropical climate, a great relief to the eye; much more ornamental in every respect to the old form of gardening in India, with nothing else than a series of beds and walks between them.

Great improvements have been made in modern days in India in this respect, and in some large gardens, landscape gardening has to some extent been adopted; but here we approach ground out of the sphere of amateurs.

Large trees are only suitable to gardens of some size.

The walks in a garden should not be straight, they should meander and bend in graceful curves opening up new vistas of beauty. The curves, however, should not be the same, but vary. These walks should be broad and commodious, yet in keeping with the size of the garden.

A large walk, say nine or twelve feet in width, would be ridiculous in a small garden: to make your garden and walks, you must exercise your own judgment and taste.

If you feel you cannot do this, or are uncertain, it would be far better to call in the aid of a professional gardener, and would be money well spent, rather than have an eye-sore and blotch for days and years to come.

A small corner of the garden should be screened off for a manure pit: and for pots, and a small tool house if necessary. This should have a hedge round it, and should be ornamental. In this all your potting operations should be done. without causing a litter and look of untidiness.

Your walks must be either edged with turf of green grass, tiles or some small growing border,—plant of a hardy sort that can be trimmed nicely, such as Alternanthera. The walks when planned and laid out, should be covered with bricks or with slates when they can conveniently be got at a cheap rate. First ram the soil down all along the walks, and have it even and level, then lay the bricks or slates down flat and as closely arranged as they can be, and over this place kunkur, gravel, or broken brick about an inch in size all over it.

CHAPTER VII.

ON THE CULTIVATION OF ANNUALS.

The propagation of plants and species.

ALL plants are, in their natural state, propagated from seed, and the multitude and variety of forms which the seeds take form a subject of study, interest, and wonder to the lover of botany. All seeds which are fertile contain a germ, which naturally, under favorable circumstances, shoots upwards, and another, which is called the redicle, which takes its way downwards, and constitutes the root of the plant. Then there are the seed-lobes which furnish the plant with nourishment in its first growth.

MOISTURE, HEAT, and AIR are necessary for the growth of plants from seed; and *most* seeds require concealment from light. All these are essential objects, and a sufficient quantity, neither too much nor too little, of each *(moisture, heat, air and light)* will to a great extent ensure the amount of success the gardener will obtain in the germination of his seeds. (Always provided that the quality of the seed is good.)

Seed sowing.

Too frequently, seed is blamed without a cause: this is due to the management being bad. The following remarks on the sowing of seeds of annuals will generally apply to the sowing of all seeds. Annuals are termed hardy, half-hardy, and tender: but all

are treated much in the same way in India, as in the plains; but at hill-stations they should be managed in the same method as in England,—the season for sowing being much the same there. I will first describe how they should be managed in the plains. The soil should be made light, and for this purpose it should be dug deep, say eighteen inches or more; and be mixed with sand and leaf mould well rubbed with the hands, and sifted. The seed should then be sown after the soil is levelled, and a little soil sprinkled over the surface above the seeds sown, and the whole pressed down lightly with the hands. Should the soil not be moist enough before sowing, water the soil first and defer sowing the seeds until some hours after. Cover the spot sown with mats till an hour before sunset and an hour or two after sunrise. The covering is best raised off the soil a foot or two at least. After the seeds have germinated the covering should not be continued, but the plants inured to the sun *gradually*, or they may die off. They will be drawn upwards and be worthless and weedy, bearing insignificant and poor flowers, if the covering be kept on too long.

As a general rule, annuals are benefitted by transplanting. While they are growing, after transplanting, they should be generously treated to watering of liquid manure, and while the soil is dry the spaces between them should be stirred up. It is better to have the plants far apart than too close when transplanting, as, should they be too close, it precludes succession of bloom from their side shoots, which do not even appear, or if they do, yield hardly any flowers, and those of a small worthless sort and imperfect in form. Thus it may be seen how easily the seedsman may be blamed, even should the seeds germinate well. The seed-beds should be watered in the mornings, when there is any likelihood of frost at nights, but otherwise they should be watered in the evenings. Most seeds of annuals are sown

in the plains of Bengal in October, with the exception of Larkspurs, Nemophila, and a very few others.

Cultivation of annual seeds and other seeds in hill-stations.

HARDY ANNUALS.—Dig deep, say eighteen inches, and for the slender growing kinds the soil may be made moderately rich with cow-dung, ashes of the same, leaf mould, etc.; but should the locality be a wet one, then leaf mould used largely should be the chief manure used, omitting, or using very sparely, all other manures. Like all plants which grow quickly, annuals require a deep soil and open situation (so as not to be checked in their growth), which will promote their duration and the beauty of their flowers. For Spring display, sow in September—a week or two earlier or later according to weather. The seeds should be sown in narrow long beds, with a foot or two between them. They should be covered lightly with fine sandy soil, and when strong enough (if too thick) be thinned out, and if this has to be done, it must be done before Winter. In March, the plants must be transplanted, being taken up in small patches containing three or four plants, to suit your taste, regulating the distances between the plants according to their habit. To secure succession of bloom, sowings should be made at intervals, and a good stock of plants be always kept ready for transplanting. Many Spring sown annuals will, if carefully attended to, outlive the entire season. Plants for Summer display should be sown in March up to May. By thus keeping up a succession of sowing in the seed-beds, and transplanting them to the border, a regular succession of bloom may be kept up so as to have a garden in full beauty from Spring to Autumn. But this is very difficult, as the rains kill many of them.

For September planting of seeds, I would recommend that they be sown in boxes; if you are at a high elevation the young plants will require to be sheltered during Winter from severe frost and snow and hail.

HALF-HARDY ANNUALS—Suffer less from drought than the hardy ones, and do not arrive at maturity so quickly, so that repeated sowings cannot be accomplished with such advantage. Sow such seeds in April or the beginning of May in a hot-bed, or well prepared soil (under glass in hill-stations), and transplant them when strong enough; when sowing in hot-beds, place a layer of leaf mould four inches deep, then a layer of equal parts of sifted soil, leaf mould, peat, or something resembling it, and sand, of the same depth. Sow the seeds in drills (by doing so, you save much seed which would be lost by hand sowing, or in other words, broadcast sowing), the finer seeds should be nearer the surface than the larger ones (for very small seeds an eighth of an inch deep or less, and for the larger ones a quarter of an inch will suffice). *Label each sowing*. If the soil is properly moist, and shaded from the sun at midday, no water should be necessary till the seeds germinate. The temperature should not be lower than 45° or higher than 50° (below 40° is sure to do injury). Air should be admitted daily, and if mildew appears, or fungus of any sort, the whole inside of the frame should be dusted with quicklime or sulphur. The plants should appear from a week to a fortnight from the time of sowing.

Half-hardy annuals: cultivation in hill-stations.

Be careful to take up the plants as not to injure the roots, keeping as much soil about them as possible. Water the beds into which the plants are transplanted *after* they are put in their places: should the seed-beds be dry when the plants are being taken up, those too should be first watered before taking up the young plants, they being delicate and liable to injury from their roots being torn. The plants should be watered every evening, except when there is likelihood of frost. Space should be allowed for the plants to branch and grow after transplanting. Some plants will require four

Transplanting and after-management of annuals.

or six inches, and some twice that space or more. When the soil is dry, it should be stirred up between the plants occasionally and frequently watered with liquid manure; Ichthemicguano *used weak* as a liquid manure is good, but any liquid manure will, if frequently used, enhance the colour of the flowers.

Tender annuals: how they should be managed in hill-stations.

All tender annuals, in cold climates, should be kept the whole time of their growth under glass, sown in pots, and plunged in hot-beds in February and early in March. When strong enough, prick out and transplant in small-sized pots, and continue shifting, as their roots grow larger, into bigger pots. They should be kept in a temperature from 70° to 80°, and plentifully supplied with water, so that the atmosphere shall be constantly charged with moisture. When they flower, they should be removed to a more dry and airy place, and the temperature *gradually* lowered: by this method, the size and colour of the flowers will be *much improved*.

General remarks for both hill-stations and the plains.

The hardier plants are, the lower the average temperature they will require for germination, and *vice versâ*; at the same time, allowing for the artificial stimulus required for young plants in their first growth. In the absence of bottom heat, or surface heat, it may be compensated for *in a measure* by early ventilation, and by closing up pits or houses with a high degree of sun heat and artificial moisture. Seed pots, or beds, should never *for a moment* be allowed to dry, as a uniform moisture is necessary, as well as a uniform heat, for successful germination of seeds.

Peculiarity of some sowings of seeds.

Abronia, *Martynia*, and *Propœolum*, as a rule, require their seeds peeled previous to sowing, *Cobœa* seeds should be planted edgeways, and *Geranium* seeds should be pricked in with the feathery tail remaining out of the soil.

Convolvulus seeds, when old, or after being imported, when the outer parts are very hard, should be slightly cut on the surface *apart from the eye*, which should be avoided carefully. *Rhodanthe*, and some other seeds of like character, are best soaked in water and then sown.

Calceolaria germinates best without heat. *Cyclamen* seed should be sown as soon as it is ripe. *Orchids* may be sown best under glass, sown on a cork, and floated on water, or sown on bark suspended in a hot-house, charged with damp atmosphere and warmth. *Mistletoe* seeds are best inserted into the bark, on the inner side of the branch of a tree. *Ferns* should be sown on the surface of heath soil, or anything resembling it, and not covered, except with a bell-glass: place the pot in a dish and keep the soil uniformly moist, till the plants are well developed, after which they may be exposed to air.

Preparation of soil.

Treating of the sowing of exotic plant seeds in pots, a most desirable point is to have the soil which covers the seeds of a suitable quality, and the bulk of the soil should be well pulverised and porous, so as not to impede their growth after germination; and another point of importance is, that the surface soil should not be retentive of too much moisture. This soil should be dried well after preparation, rubbed with the hands, and when making use of it, sprinkled with water and passed through the hands till it is easily spread. This prevents the soil becoming sour. A greater depth of this soil can be used, so that the moisture below is kept up, and the seeds are thus, being deeply covered, less liable to injury from atmospheric changes. The bottom soil should be well moistened *before* the sowing of the seed, and should be made even carefully; the seeds should then be sown, and the surface soil sprinkled over them, and copious watering should be avoided, at least for a time. All water should be judiciously administered till the plants are strong, and the softest seeds should be gradually

Watering.

moistened, till their vital organs allow them to digest it. The omission of a single watering may destroy plants, so that there should be a given period for watering, to be tried by experience.

When annuals are planted out, flooding them with water is prejudicial to them—watering overhead is much better. Watering overhead or otherwise when the sun is powerful should always be avoided, as it then tarnishes the leaves and flowers, and the general time for watering plants should be during the evening, when the sun's rays are not so powerful as to allow of its injuring foliage or flower.

TO MAKE A HOT-BED.

The dung used should be forked, or turned over frequently for a fortnight, say eight times or more (to prevent its injuring the plants it is required for); then mix it with the same amount of leaf-mould, which will make the heat more lasting and the soil will be sweeter. Dig out about eighteen inches of soil, and in this place your compost, treading or beating it down till it is level and not liable to sink more in one place than another. In this sow your seeds or place your plants under glass, and regulate the heat by tilting the glasses or closing them. Over the whole a shed should be placed, or a colored sheet drawn, to prevent the rays of the sun shining directly on the glasses on the bed. Light is very essential, so that the plants do not get drawn up and weedy.

CHAPTER VIII.

ON THE PROPAGATION OF PLANTS.

Other modes of propagation.

XCEPT in the case of annuals, a great deal of time is lost in propagating by seed; and, also, seedlings do not always prove true to their parents; hence the plan of multiplying plants by cutting has been resorted to. Further, I may add, all plants bearing double flowers do not bear seed in this or other climates, which induces the horticulturist to resort to other modes of propagation. Each branch under its outer covering hides numbers of tissues, which, under favorable circumstances, throw out roots if placed in soil or sand, as the case may be. Plants thus raised from cuttings, as well as from budding, in arching, and grafting, will be the same as the mother plant in respect to their flowers or fruits. Cuttings taken from any plant on their own roots, will be identical with the mother plant in every respect as to flowers, fruits, or to the plant tself; *but plants budded or grafted on to others* may be dwarfed or increased in size, in accordance with the nature of the stocks they are budded or grafted on, though the flowers and fruit remain the same. Sometimes plants budded or grafted *sport or vary* from the original, and in such case should the sport be a desirable one, the branch it appeared on should at once be propagated from. The more vigorous stocks increasing the size of the budding, or a weaker stock producing a dwarf plant from the budding (this applies also to grafting).

Propagation by cuttings.

The soil in which cuttings are stuck should be very sandy, in fact, almost entirely sand, and the soil kept well moistened.

Make your cuttings about three or four joints long, and cut close beneath a bud, after which insert them in the soil about one-third, and shade them from the sun till they have taken root and thrown up shoots.

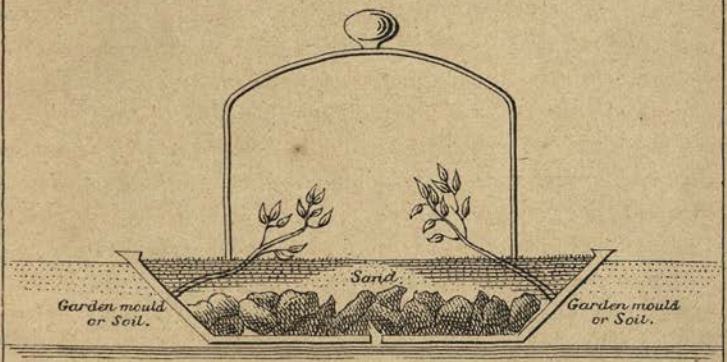
Mr. G. Marshall Woodrow, of Poona, shows in his book a plan very generally used for propagating cuttings of delicate plants. I will quote what he states regarding such cuttings of plants as *Poivrea Coccinea* and *Bougainvillea spectabilis* :—"First, potsherd should be placed at the bottom of the pot, arranged carefully, so as to secure thorough drainage [one of the principal secrets in striking cuttings in pots, then a layer of moss [if it cannot be procured, then use cocoanut fibre]. On the top of this place a mixture of leaf mould and sand, let it come up to within two inches of the rim of the pot, then add one-and-a-half inches of sand or brick-dust." The cuttings should be inserted in the top layer, barely touching the second one, so as to reduce the danger of rotting, and have food ready for the young roots as soon as they appear. "The whole should then be kept in a glass case, *or covered with a bell-glass.* Water should be given frequently, but in small quantities." *(See Fig. 1, Plate I.)*

All hard-wooded plants take root best in pure sand, and soft-wooded plants require light soil.

Should soil be used, the best compost is leaf mould, coarsely powdered charcoal, and silver sand in equal quantities. I have found the plan that Firminger recommends as good as any for the propagation of cuttings. Use a shallow pan, and potsherd for drainage; over this place a mixture of sand and leaf mould in equal parts; in this place your cuttings so that their bases are nearly against the side of the pan, with their ends sloping to the centre of the pot. Then put a hand-glass over them. Keep the pot in shade, and cover

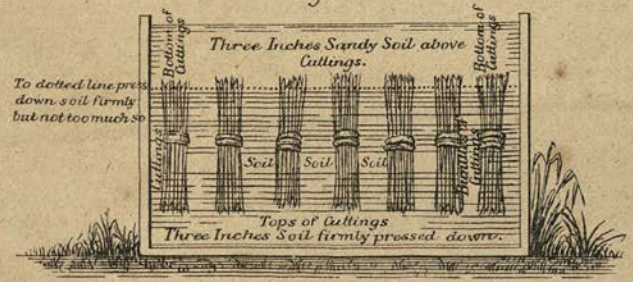
Plate Ia.

Fig. 1.



Section of cuttings under a Bell-Glass.

Fig. 2.


Three Inches Sandy Soil above Cuttings.
To dotted line press down soil firmly but not too much so
Soil
Soil
Soil
Tops of Cuttings
Three Inches Soil firmly pressed down.

A new method of striking cuttings.
Section of box containing cuttings buried in soil.

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it at night with a bit of matting, to prevent the effects of radiation from cold, which would be injurious. The figure will illustrate the method of proceeding better even than any written explanation. The pot should be sunk in soil nearly to the rim, as shewn *(Fig. 1, Plate I).*

Cuttings struck in a sloping position do best with most plants, while some do very well any way. Only a couple of buds should be left out of the soil, certainly not more than three in any case. When glass is used, and condensation takes place on the same, it should be taken up, wiped and replaced, and while this is being done the surface sand or soil should be gently turned up with a fine-pointed instrument; this will prove beneficial by preventing green mould.

A new method of striking cuttings of hard-wooded plants.

A new method of rearing cuttings* of hard-wooded plants is now in vogue, and I have found roses succeed well by treating them as follows :—Make cuttings about six inches long in the ordinary way (cut close over a bud straight across the stem on the top of the cuttings, and obliquely under a bud at the foot of the cutting). Tie them in bundles of fifty, and dip the bottom ends in a mixture of cow-dung and water of the consistency of thick cream. Take a box about a foot deep, put three inches of ordinary soil into it and press it down firmly, on this put your bundles of cuttings with the bottom end of the cuttings upwards, or in other words the reverse of the ordinary way, so that the plants would be growing with their roots upwards. Sprinkle in more ordinary earth between the bundles of cuttings and press it down firmly as you go on adding it until it is within half an inch from covering the cuttings. Then take soil three parts and sand one part, mix it and fill the box with it, thus completely burying the cuttings. The cuttings should be watered lightly daily, or every two days, as requisite, to keep up *a regular*

* *See Fig. 2 in accompanying plate.*

moisture for about three or four inches in the surface soil only, and the cuttings will in about eight weeks, or nine at the outside, have sent out roots in the surface soil, and most of the buds will have swollen while others have already started into growth. The cuttings may then be taken out by inverting the box bodily, and each one planted as ordinary rooted plants, but with only one, or at the outside two buds above ground. The plants will then be better for being shaded for a few days. In the cold season the box containing the cuttings may be placed in the garden in the sun, but in the hot weather it is best kept in the shade. The plan is an American one, and a most ingenious mode of utilizing sun heat or superficial heat for bottom heat. I first learnt this method from a letter in a periodical by Mr. Francis, and we are no doubt much indebted to our Transatlantic cousins for a method, the efficiency of which I can practically vouch for, of propagating hard-wooded plants, trees, and shrubs. I made an improvement by adding the light soil on the surface of the box, as before mentioned, and by remarking that the soil below and between the cuttings should be well pressed in; for should the water penetrate too far, it will be found that both ends of the cuttings will have formed calyxes, which is obviously not desirable.

Of striking cuttings in water.

Sir Joseph Paxton observes of striking cuttings in water; that the cuttings should be *of green wood taken during the full growing season.* The bottles used should be large, and the water changed frequently. In doing so they should be replenished with tepid water, and be sheltered from wind and sun, but having all the light and air possible, and be removed from cold air at night into a room.

Heliotropes, Verbenas, Habrothamnus, Lobelias, Begonias, Roses, Salvias, Balsams, and Dahlias may be easily propagated in this way.

Cuttings struck in sand and water.

Cuttings may be struck in sand and water. This is almost the same as propagating cuttings in water alone, as the sand only answers to support the cuttings; the whole process is the same, only that a little sand is placed at the bottom of the bottle. Rain-water is the best for the purpose. The sand must be perfectly clean to prevent its getting sour, and the shoot taken off as short as possible, having only the lower leaves nipped off near the stalk (not too close to it). The bottle with the cuttings should be placed in a warm place. The cuttings raised thus must have their roots filled with sand when they are removed.

Hybridizing.

The points to be gained by hybridizing are, the obtaining of new varieties, the improvement of one of the two flowers on which we work. To obtain the qualities of a plant of tender habit on a hardy one; of one of good habit on a plant of coarse and bad habit.

How the operation is performed.

The pistil of the flower which has to be operated on has to be impregnated with the pollen of the male flower, or the one which has to convey the desired quality to the female, or seed-bearing plant.

The seed-bearing plant must be watched, so that *as soon as the flowers open*, the part called the stamens is seized with pincers and removed, as it contains the farina which would impregnate the plant itself, and these stamens must be got at before they burst. Then it is necessary to watch the plant that bears the farina or pollen with which the seed-bearing or female plant (as we will call it for the sake of distinction) is to be impregnated, and when the pollen is ready, and the pistil of the female flower looks glutinous or gummy, the pollen should be applied to it with a camel-hair pencil. If the pollen is not ready when the pistil is glutinous, the operation cannot be performed: but on the other hand, should the farina have to be kept for some days, the operation can be performed successfully. The farina may be kept by

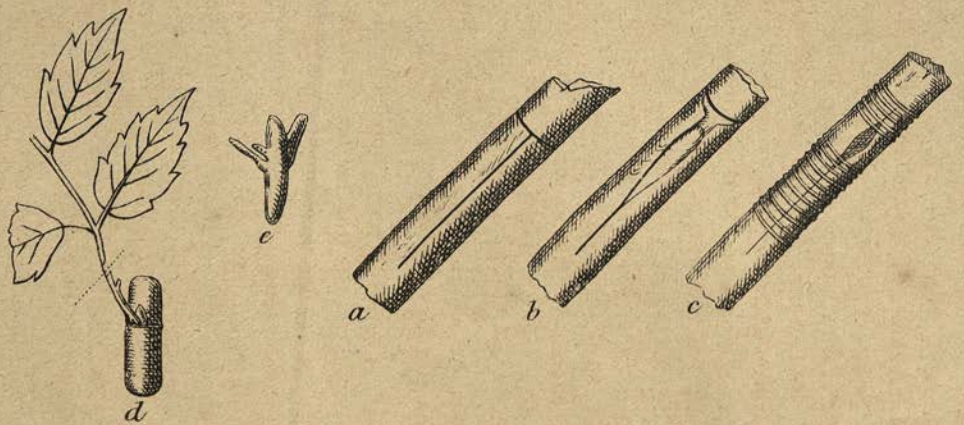
taking the flower off the plant and floating it on water in a finger bowl and then covering it with a tumbler or wine-glass. Some flowers are more easily impregnated than others, while others resist hybridizing more persistently, though even these yield after repeated attempts and failures.

Budding.

Budding is a most easy process, but nevertheless requires to be done neatly, as well as with care; and the season chosen should be when both the plant the bud is taken from, as well as the plant to be budded on, are in growth: to ensure success, this is absolutely necessary. Another point frequently argued is, whether cloudy or dry weather is best for the operation. I am *decidedly* of opinion that dry weather is the best; as the sap in the plant is then thicker, and more gummy, and the bud consequently unites sooner; whereas in cloudy weather the sap is thin, to add to which there is the chance of rain, which would be almost certain to kill the budding. The bark should yield readily to be separated from the wood; if it tears away with difficulty it is almost useless to try it.

Make a gash up and down along the length of the stem, and one across it at the top, so that the two cuts will form a T *(see fig. a., Plate II)*. Then take the bud from the plant on which it is growing, *selecting a plump bud* with its leaf-stock on it, cutting off the leaf only *(see dotted line, fig. d., Plate II)*. Pass the penknife or budding knife into the branch about half-an-inch above the bud, and take off a thin slice of the branch, taking your knife out about three-quarters of an inch below the bud (having taken off a piece, such as is shown in *fig. d., Plate II*). The next thing to do is to remove the wood from the bark, which is sometimes difficult, and especially so to those who are not neat-handed, for the bark should be as little bent as possible, and the eye saved from injury.

Plate II.



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To do this properly, hold the bud by the leaf-stem between the finger and thumb of the left hand, insert the thumb nail of the right hand between the bark and wood of the shield, and pull it down carefully; all the time preventing the bark of the bud from being bent *(see fig. e., Plate II)*. Having separated the bark on the stock with the back of your knife, or budding knife, insert the bud *(see fig. b., Plate II)* and tie it up, *not too tightly*, with some cotton, or hemp twisted *(see fig. c., Plate II)*. When the gardener is watering the plant, care should be taken that he does not allow water to drop on the bud. After the bud has shot out about an inch, the binding round the bud should be cut off, and the branch should not be headed down till the bud has grown to be pretty strong. Another precaution is yet necessary, and that is, that the shoot from the bud should be tied to a stick, stuck into the ground, as, till it has matured considerably, it is liable to be blown down and broken where the bud was inserted. A nice bushy plant may be formed by pinching off the top when the shoot is large enough, which depends on the sort of plant under treatment.

Grafting.

Stock, or *subject*, are the terms applied in garden nomenclature to the tree on which the operation is to be performed; *graft* and *scion* to the part of the plant which is implanted on it. There are many modes of grafting; however, I shall only mention the most convenient and easy method, namely, *tongue grafting*. The plants bearing the scion and the stock should both be in full growth, and the season chosen should be about the middle of the rains, but this greatly depends on the growth of the trees or shrubs in question.

The scion should have plump buds, and be of well-ripened wood. Cut off the head of the stock *(see fig. A., Plate III)*, make a slit in the same *(see fig. B., Plate III)* about 4 inches long according to the size of the graft to be inserted, and keep the cleft open with a wedge till the scion is prepared.

Then choose a graft with a bud at its summit *(see fig. a., Plate III)*, and shape the lower part *(see fig. b., Plate III)* to fit the cleft *(see fig. B., Plate III)*. This should be done accurately, and the union tied with twisted hemp or tape, and covered with grafting-wax or clay; wax being the best, as by excluding air the union is facilitated, and the scion kept moist and fresh. *Fig. C* is what is called double tongue-grafting, and only differs from the first by having two grafts inserted instead of one, and is preferable when the stock is large enough, as it allows of the wound healing sooner, besides the chances of success being two-fold.

Care should be taken *in either single or double tongue-grafting* that *the lower part or tongue of the scion should slightly slope outwards (as in fig. C., at e. e., Plate III)*. The tying will bring the scions properly together if the same be begun from the top of the stock and executed downwards. The grafting-wax should be put on from the top of the stock to the end of the cleft.

Grafting-wax: recipé for.

The following recipé for grafting-wax will be found good (Cobbet's) :—

Pitch and resin	...	...	4 parts.
Bees'-wax	....	...	2 „
Tallow	...	...	1 part.

Melt and mix, and when required for use, it must be applied only lukewarm.

Another receipt for grafting-wax, called French grafting-wax, is made as follows :—

Black pitch	...	...	28 parts.
Burgundy pitch	...	...	28 „
Yellow wax	...	...	16 „
Tallow	...	...	14 „
Yellow ochre	...	...	14 „

Plate III.

Fig. A.

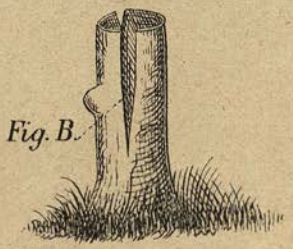

Fig. C.

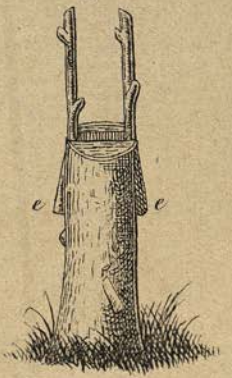

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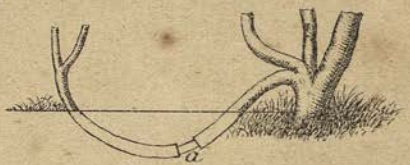
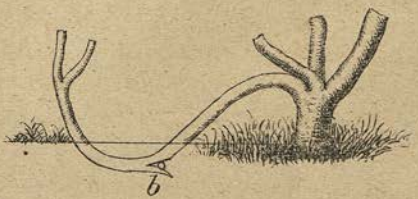
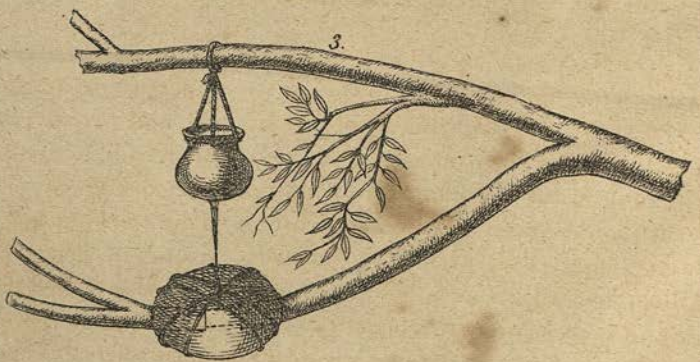
Plate IV.







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Melt and mix and apply warm, but not so hot as to injure the tree, applying it with a brush till the coatings are thick enough.

A receipt given by Mr. Marshal Woodrow seems to me to be well suited for all purposes, and is as follows :

Equal weights of rosin, bees'-wax, lard and turpentine melted over a slow fire.

"When required for use, the wax should be heated by a water bath in the way that glue is heated, and applied to the graft by a brush ; when used, the wax should not be hotter than the hand can bear."

Propagating by layering.

Propagation by layering is performed by cutting off a ring of bark at the point of the branch bent under the soil, or by making a slit in the branch at the same point—*(See figs. a & b., Plate IV).* When a slit is made, a small piece of wood should be placed in the slit to keep it open, and the spot where either this slit, or the place where the bark is taken off, should not be more than two inches under the soil.

Propagation by Gootee.

The bark is taken off in a ring round the branch of a tree for an inch (or more according to the thickness of the branch), and having procured some of the soil which is found round any native oil mill, or if that is not obtainable, some retentive sort of clay, mix it with some rotten oil-cake, and paste it round the branch, for about a foot or less, in a ball. Then cover it up with gunny or canvas and tie the whole with string. Over this (called the gootee) suspend an earthen chatty ; having made a small hole in the bottom of it, and having passed a string through this hole (with a knot at the end, to prevent its slipping out of the hole in the chatty) to the gootee which you have made. Keep the chatty constantly filled with water, taking precautions that it

does not leak out too fast, by having the attaching string thick enough to fill the hole well. *See fig. 3, Plate IV.*, which will illustrate how this operation should be performed. In a short space of time the rootlets will appear, coming through the gunny or canvas, when the branch may be taken of and planted in a pot, or in its place in the garden.

CHAPTER IX.

GARDEN PESTS.

THIS requires a special chapter to itself; for in India more so than perhaps in any country insect life abounds, and many of these are the enemies of plant life.

A little care, and knowledge of what to do when plants are attacked, will save many beautiful or useful plants and keep them in health when they might otherwise be lost or only drag along in an unhealthy or worthless condition.

An unhealthy plant is at all times unsightly and should be attended to at once, as the remedy is then easiest.

The best thing of all is to keep your plants in good condition, and in such case they resist disease. Vigorous plants are less liable to the attack of insect pests than feeble and unhealthy ones.

When Green-fly attack a plant, they increase at an enormous rate, and simply cover all new shoots and then old leaves.

The Lethorion patent vapour cone, if used as directed, will rid your plant of all these pests. No insect will live under its influence, though it will not in the slightest degree injure the most delicate plant. If your plants are in a conservatory, close all the ventilation carefully and light a cone of "Lethorion." One cone will be sufficient for 500 cubic feet. If you have no conservatory, remove your plants into a bathroom or any

Red-spider, Green-fly, Aphis rosae or plant lice, Aphis langera which I am not sure is prevalent in this country, Thrip, Mealy bug, Red-spider Scale, Caterpillar.

other small room, and burn the Lethorion cone there, closing all ventilation carefully. It is the best and safest modern invention known for insect pests. When caterpillars are few, they can be easily picked off and killed; but sometimes they are in multitudes innumerable. Plants in the open ground can be fumigated by having a large box made to fit over any one of them at a time, and can be used always when one is kept for the purpose. Several pots too can be placed under this box and fumigated at one operation. The cone can be extinguished by putting a little dry earth on it, or into it, and putting it away in an air-tight tin such as artificial manures are sold in, and when required for use again the earth can be picked out. But this economy is not always wise.

The Lethorion cone may be purchased at the Himalayan Seed Stores, Barlowgunge, Mussoorie, N.-W. P.—and I mention it as I do not know of any other seedsmen in India who sell it at present, at Re. 1 per cone.

One pound soft soap dissolved in three gallons of water, and a quart of strong tobacco water added to it, makes a good solution to syringe plants with; after which, say in about a quarter of an hour, syringe with fresh water.

Tobacco powder applied with the duplex powder distributor mentioned on page 53, or Sulphur Helleborne or Thanotos powder serves the same purpose.

Ants.

Ants may be destroyed by leaving half-picked bones about, and when covered with them, dropped into boiling water. Sulphur powder is harmless and will drive them away from pots when sprinkled over the soil. Guano drives them away. Camphor water is also useful and harmless to plants. Chalk when applied round the stems of fruit or other trees, prevents them from ascending. It should be applied in a broad line round the stem of the tree or shrub (say 2 to 3 inches broad).

Almost all the last mentioned remedies will be required to be repeated, as some of these wretched insect pests are most tenacious of life.

Mildew. Mildew is often, I think, engendered (especially in roses), by over manuring, at the time the soil is dry. Syringe plants attacked with sulphur, soapy water and tobacco water described above, or use the duplex powder distributor with flowers of sulphur, and water the plant affected well. Syringe frequently with water only. The Lethorion cone is the best remedy. Water the plant well at its roots.

Ants. It is said that white ants will not attack any plant in a healthy state of growth, but I much doubt the truth of this, for in some places where they are numerous, on manuring a plant they at once destroy it. In such soils I recommend liquid manure being used. When a plant is attacked, water the soil with a weak solution of blue vitriol and water, and frequently stir up the soil. They attack wooden posts, and to avoid this char the posts in a fire, to a little above the distance they have to be buried in earth, or apply tar over them. I believe that creosoting timber is an effectual mode of preventing white ants from attacking it, also steeping timber or wood in a strong solution of blue vitriol (the *tootea* of the bazaars).

Scale. First steep the wood in the solution of vitriol, then dip the wood into lime water, and it not only resists white ants, but it also keeps for a much longer period without rotting.

This method I must highly recommend as being the best.

Crows and other birds. Crows are sometimes very destructive, and may be seen in beds pulling up bulbs or tearing leaves to bits and destroying fruit. Nets may be used beneficially.

Snakes.

Snakes are troublesome, but may be kept away by scattering leaves of bazaar tobacco about bushes or broken rockeries they are likely to frequent. Should they get into holes or drains, dig them out and destroy them; or, if that cannot be done, get a small empty stone ink-bottle, fill it with gun-powder, ramming it down well, attach a long slow match to it and put it into the hole as far as it can go. The end of the slow match being out of the hole, should then be fired. The concussion will kill the snake, but if the charge of gun-powder be too large you will blow up the soil, and any plant near it may suffer.

Rats.

The following method of destroying rats is recommended: take an earthen *ghila* or chatty, make a hole in the bottom of it, fill it with hemp and jute cuttings and some rosin. Place the mouth of the chatty over the rat's hole, having previously closed up the other outlets, place live charcoal on the contents of the chatty, and blow with a pair of bellows, or with the mouth, into the hole in the bottom of the chatty. The smoke will be so dense as to kill the rats. I can vouch for the efficiency of this mode. Poison is dangerous, especially where there are pet dogs or poultry. Traps may be employed, but they soon get too cunning for them.

Earthworms and underground grubs, such as the cabbage grub, etc.

Earthworms are sometimes very troublesome, especially to delicate plants, and they infect richly manured plants, such as Chrysanthemums, which have been supplied with crude horse or cow manure in their flowering pots. Soot water is most efficacious if applied as directed under the head of manures. Use it daily for three or four days, and not a single earthworm will remain. To cabbages soot may be applied mixed with the soil at its roots.

Slugs.

Slugs are not infrequently very destructive, difficult to get rid of, and not uncommonly are so numerous that they cannot be destroyed by picking them up and killing them off. Bran is a favourite

food of theirs when they can get it. Place some in any spot they frequent, and after dark they will be found on it, when they can be picked up and destroyed. The application of lime water is effective. It is prepared thus. Unslaked lime one pound is added to two gallons of water. Apply this to the beds infested by slugs.

CHAPTER X.

DESCRIPTIVE LIST OF GARDEN PLANTS.

ABELIA.

Nat. ord., Caprifoliaceæ.

VERY ornamental shrubs:—

A. Trifolia, flowers in threes at the ends of the branches, pale yellow, tinged pink. Leaves small lanceolate.

A. Floribunda, rosy purple flowers, about two inches long, in axillary clusters. Leaves opposite oblong. A Mexican species three feet high.

A. Rupestris, small pink flowers, sweet-scented, in twos at the ends of the branches. Leaves small, oblong, hairy. Propagated by cuttings.

ABROMA.

Nat. ord., Slerculiaceæ.

A. Augusta, a large shrub bearing dull red flowers of ear-drop like form, followed by five winged seed capsules. Leaves of a dull green ovate-lanceolate. Lower leaves cordate, three to five lobed. *A. Fastuosa*, also a large shrub with purple flowers. Leaves five-lobed on the lower branches, upper ones ovate.

ABRONIA.—*(Annual.)*

Nat. ord., Nyctaginaceæ.

A small annual of creeping habit with succulent stems, and with flowers much resembling those of a Verbena. The seed should be sown at the same time with those of other annuals in October, or at the close of the rains, in the plains. They thrive best in pots or shallow broad pans,

trained over any small trellis a foot-and-a-half or two feet high, placed in a sloping position. The flowers of *Abronia umbellata* are rose colored, as also that of *A. Fragrans*, whereas that of *A. Arenaria* are yellow; the first two varieties having slightly scented flowers, I recommend them for pot culture, as their flowers being small and the plants trailing, they are best seen when raised up to view. Care should be taken in watering them, as they, like all other succulent plants, are liable to damp off. In hill-stations they should be grown in the way recommended for the cultivation of tender annuals in such localities which is in spring. Sparrows are destructive to them. It is not often seen in gardens now, but is a pretty trailer and well deserving a place.

ABUTILON.

Nat. ord., Malvaceæ.

A species of shrub of tall growth. All plants of Abutilon require more or less shade from sun, and protection from wind and rain. Their leaves are of a refreshing green, and they are best renewed yearly by cuttings placed in sand or propagated by seed. Their flowers are bell shaped and pendulous, the petals folding or overlapping each other. They are most showy, decorative and free growing, half-hardy perennial shrubs: and do well in or out of doors. In the hills they are quite at home, and many varieties at least resist the cold to a great extent.

The seeds of Abutilon should be first soaked for an hour or two in water and then sown in October in the plains, and in March or April in hill-stations. Keep the soil moist, or the seed may lie dormant for a long time. When the plants are large enough, prick out and plant them in pots of rich light loam in the plains, where they may not stand the heat in the open beds so well. In the hills they do very well out of doors. This plant has been much improved in flower and foliage. Below are some of the best varieties of late introduction, which much supersede the older ones.

A. Boule de Neige, pure white.
A. Darwini, orange, veined red.
A. Eclipse, golden spotted leaves semi-drooping habit.
A. Ercota, erect flowers, pink, veined orange.
A. Golden Bells, deep with rich yellow, free blooming.
A. Mary Miller, deep rose.
A. Megapotamicum, a running variety, bright red, yellow and brown centre.
A. Megapotamicum. Var., like the above, with golden spotted leaves.
A. Snow-storm, semi-dwarf in growth, white flowered.
A. Sultan, fine deep red flowers. *A. New Japanese*, maple leaved. *A. Savitzie*, very handsome.
A. Thompsonii Plena, double flowered, orange. Golden spotted leaved. Distinct from these are the dwarf Abutilons, only 18 inches high. *Calypso*, white. *L'African*, dark crimson. *Infanta Eulalie*, pretty light blush pink.

ACACIA.

Nat. ord., Leguminosæ.

These plants are not suited to the plains of India. Most of them are plants of great beauty, and some varieties do very well in the hills. They are natives of Australia, Mexico and the East Indies, but those of the latter country have very little pretension to beauty. The two last mentioned—*A. Farsiesiana* and *Sortuosa*—grow well on the plains. Among the most beautiful varieties are :—

A. Albicans, with silvery white foliage.
A. Balsamea, yellow, six feet high.
A. Drummondii, yellow.
A. Lophantha, with fine fern-like foliage.
A. Rueana, very handsome, pale yellow flowers in long spikes, deserving of attention. Habit like a weeping willow.

A. Odoratissima pendula, yellow, pendant blossoms, and fragrant.

A. Spinosa, rose colored with white.

A. Ixiophilla, golden yellow.

A. Farsiesiana, a large bush, with globular yellow flowers, highly scented, and

A. Sortuosa, a thorny shrub, grow well in the plains. The latter forms a good hedge.

They all require a sandy loam and perfect drainage. Propagate by seed.

ACALYPHA—*(Foliage.)*

Nat. ord., Euphorbicaea.

Plants with fine ornamental foliage, suitable to pot culture, or for beds, or isolated specimens on lawns. All of them are highly ornamental and easily cultivated. Propagated from cuttings. Their leaves are of an elongated heart shape and beautifully marked with various colors—bronze, red, yellow and shades of green. *A. Colorata* and *A. Colorat bicolor*, *A. Densiflorn*, *A. Illustrata*, *A. Makafeeana*, *A. Macrophylla*, *A. Marginata* and variety, *A. Musaica*, *A. Tricolor*, *A. Forta* and variety: all of these are handsome foliage plants. *A. Sanderianum* is a fine new introduction, as yet not much known in India.

ACANTHUS.

Nat. ord., Acanthaceæ.

(Vernacular, Hurkut, Hurcooch, Kanta.)

These are stately plants of the Thistle tribe, several of which do well on lawns as specimens. They require a deep soil and sunny situation. Seeds sown in September or October in the plains do well, and some varieties do in the hills sown in April.

A. Molis Latifolius, large handsome foliage, more robust than the next,

A. Molis, foliage heart-shaped, two feet long by one broad. Plant grows three to four feet high.

A. Chandelabrum, very pretty.

A. Spinosissimus, novel, with rose-colored flowers and white spines.

ACHIMENES.

Nat. ord., Gesneraceæ.

These are beautiful plants, and they have flowers of almost every shade of color. Being suited to grow in flower pots, as decorations in a room they are most desirable. They have tuberous roots, and the tubers, which are small and covered with scales, are easily injured by rough handling; to avoid their being destroyed, they should be placed on the soil in the pots they are to occupy, and the finer portion of the earth, well sifted, should be sprinkled over them just as a top covering. The pots or pans they are grown in should be shallow and *well drained*, and the soil an open one, composed of sand, a little loam and leaf-mould chiefly, with some cocoanut fibre mixed with it, so as in a measure to resemble a light, fibry, heath soil. The plants should be started in growth by watering copiously as soon as the weather grows warm in February or March, in the plains; and in hill-stations in April. When they are in growth, they would be much benefited by watering now and then with liquid manure. Just before the rains set in they should be in flower, and go on flowering till nearly the end of the rains. They are propagated by division of the tubers, taking care not to bruise them. They are also propagated by cutting off the points of the shoots in August, and placing them in sandy soil under a glass, as also by the increased number of tubers. Care should always be taken that the leaves and flowers are not touched by water when it is being applied to the plants, so the best plan is to water them from the edge of the pot.

They grow very prettily in baskets filled with moss, with a little soil in the centre, or some moss tied together with a

handful or two of earth suitable for them, containing in the centre of it the tubers, the whole being tied up with wire. In this way they are objects of great beauty, hanging over the moss or basket, with their flowers raised up to view. These plants are grown most easily, and the beauty of these lovely flowers fully repays the cultivator, who may choose from a very large variety, all of which thrive well in India, though I have in instances found them to revert to the more ordinary colors. The flower somewhat resembles that of the Petunia, but has a flattened limb. Some of the varieties bear very large flowers of brilliant colors, while others are remarkable for their peculiar markings. All of them are effective, and will richly repay the amateur for the little care and attention they require in comparison to some other plants less deserving, and of inferior beauty. It is needless to give a list of the varieties that may be obtained, as so many new descriptions are continually being introduced, and if procured in this country, may be obtained generally from most seedsmen and from the Botanical Gardens, Saharanpur, who import tubers of all the best named varieties largely.

Of these plants there is a large variety. When the tubers are taken up after the plants have died off, they should be named and placed, wrapped in paper; or left in their pots till the following season, which I think is better *(not left dust dry)*, and in which case they keep better. As many as six or eight tubers may be planted in a pot of about fourteen inches in diameter, according to the habit of the species, as some grow much larger than others. Some grow erect, while others hang down if suspended, or creep over the sides of the pot they are planted in.

Culture in hill-stations.

When peat is procurable, a compost of it should be made by mixing it with loam and silver-sand, under which there should be good drainage. Seven or eight tubers should be placed in a five or six-inch pot, with their ends inclined inwards.

While growing, liquid manure, frequently used, will be beneficial. Commence starting them in heat in February by plunging the pots into a hot-bed; as one lot is taken out, another lot should take its place, and so on, till about May, when they may be started without the aid of heat. By this method a succession of bloom may be kept up of this lovely flower.

ACHYRANTHES.

Nat. ord., Amaranthaceæ.

A. Alopecuroides, a small plant with fox brush like flowers of a white color. Raised from seed sown in October. Of easy culture and rather pretty.

ACROCLINIUM.—*Half Hardy Annual. (Everlasting flower.)*

Nat. ord., Compositæ.

This annual bears flowers of a dry nature, much resembling paper cut to the form of an artificial daisy. They are effective when sown or planted in masses, or as ribbon borders. There are two varieties of this plant, *A. Roseum* and *A. Album*. The one being rose colored with a yellow centre, and the other white with a yellow centre. The seeds should be sown at the same time with other annuals, in the plains from October to November, and in hill-stations in March, April and May. The seeds should be sown in pots, and the plants gradually accustomed or hardened to the full exposure of the sun. The plants are at first tender and succulent, and should be carefully watered, or they will damp off from excessive moisture. Afterwards when hardened they stand any amount of exposure to wind, sun and draught. The flowers, when cut and kept dry with ornamental grass, form a handsome ornament, and in this way last and retain their appearance a long time. The old varieties have been somewhat improved in *A. Grandiflorum atro sanguinium*,

which has large dark flowers; *A. Roseum floropleno*, rosy delicate pink, fading to a lighter color. These are less liable to close in damp weather.

ADENANTHERA.

Nat. ord., Leguminosæ.

A. Pavonina, a tree, but kept well trimmed as a bush is pretty. Flowers white and yellow. Leaflets oval, smooth on both sides. Propagated by cutting during the rains.

AECHMEA.

Nat. ord., Bromeliaceæ.

Very handsome genus of plants, suitable only to the plains or warm conservatory culture in the hills. Their flowers are borne in scapes panicled. Leaves sword-shaped, sometimes with spines along their edges. They are propagated by suckers or offsets which appear after their flowers have died down. These are taken off and planted singly in a light soil, when a moist heat easily roots them. Strip off some of the lower leaves before planting. The plants, when rooted and large, require large 32 sized pots. When small they do not require much room. These plants are epiphytal in their nature, and do not require much water or much root room. Water may be supplied more freely when growing freely or sending out their flower. They must have particularly good drainage, and no water must be allowed to collect round the crown of the plant.

Æ. Calyculata, flowers bright yellow and tubular, with red bracts on an erect scape in roundish heads.

Æ. Cœlestis, flowers sky blue, in pyramidal panicles on an erect scape.

Æ. Coerulescens, very pretty deep lilac flowers in dense heads, followed by white berries.

Æ. Exudans, orange flowers; *Fasciata*, rosy pink; *Fulgens*, deep rich red; *Fustenbergi*, rose; *Glomerata*, violet; *Hystrix*, dense, oblong spikes, floral leaves and bracts scarlet; *Lindeni*, yellow, red bracts; *Mariae Reginae*, lipped blue changing to salmon, bracts boat-shaped, rose pink; *Melinoni*, scarlet: *Artgiesii*, red; *Spectabilis*, rosy, corola rosy crimson; *Veitchii*, scarlet.

ADIANTUM.—*(Maiden Hair Fern.)*—*See Ferns.*

ADONIS.—*Flos Adonis. (Pheasant's Eye.)*

Nat. ord., Ranunculaceæ.

An unpretending little annual, but cheerful in appearance, with its bright crimson flowers and finely divided leaves. It thrives best in shade, and requires a very light soil. Sow the seeds in October to November in the plains, and March to May in hill-stations.

Adonis Æstivalis or *Flos Adonis* has bright crimson flowers.

A. Autumnalis or pheasant's eye bears crimson flowers in Autumn.

A. Vernalis bears yellow flowers in Spring, and should be sown in the hills in Autumn.

AERIDES.—*See Orchid.*

ÆSCHYNANTHUS.—*(For the plains.)*

Nat. ord., Gesneraceæ.

Lovely twining shrubs with opposite leaves and axillary terminal flowers. They are worthy of extensive cultivation, having deep green leaves and fragrant flowers. They are easily grown on a block which must be covered with moss, on to which they should be tied with copper wire. The roots should first be covered with moss before tying them on to the block, after which they require syringing with water as necessary,

and occasionally they should be dipped in tepid water. They may be grown in pots in light rich compost, and trained up a small trellis. Propagate by cuttings of 2 to 3 inches of half-ripened wood, which root readily in February or March. All the leaves should be removed but one or two at the top, and they should be placed under a bell-glass in moderate bottom heat. When they are rooted transfer singly to small pots and again covered with a bell-glass in bottom heat till established. Baskets are commonly employed for them, and is an effective way of growing them. They should be lined with moss and filled with rich light compost, and the branches fastened down with pegs. Water well in summer to induce growth, and in the cold weather let them rest. They flower from cuttings in the second year. Growing from seed is unsatisfactory. These plants are chiefly natives of Java and South America, but *Æ. Fulgens** is a native of the East Indies and was discovered in 1838, when introduced to *Kew*: flowers deep bright crimson, very long, throat and tube on the under side orange. The lobes are striped black, flowers in umbels in October. *Æ. Grandiflorus** is large flowered, deep crimson and orange: the segments with a dark mark on top, and the umbels are many flowered; produces in August. This too is an East Indian variety. Other varieties are *Æ. Atrosanginea*,* dark red, one flowered, in July. *Æ. Aucklandi*, syn. specious, rich orange flowers. *Æ. Boschianus*,* flowers scarlet, calyx purple-brown. *Æ. Cordifolius*,* heart-shaped leaves, deep red flower striped with black. *Æ. Javanicus*, flowers bright red, yellow throat. *Æ Lobbianus*,* flowers rich scarlet, corymbs bractate, terminal flowers, in June. Scandent. *Æ. Longiflorus*,* flowers scarlet, erect in Summer. Penulous plant. *Æ. Miniatus*, flowers rich vermilion. *Æ. Pulcher*,* flowers bright scarlet. Scandent plant. *Æ. Splendidus** is a hybrid: bright scarlet, spotted black on the margins. *Æ. Zebrinus*, flowers greenish brown. *Æ. Tricolor*,* flowers

* The best varieties are marked with an asterisk.

deep blood red (generally twin-flowered), the three upper lobes striped black, throat and base of lobes bright orange.

AGAPANTHUS.

Nat. ord., Hemerocallidaceæ.

This African lily has a bulb much resembling an onion or leek. The flowers of most of the varieties are blue or white and extremely handsome, and the foliage also is pretty A description of it is given in the Horticultural Society's Botanical Register for 1843. The plant should be repotted in February in a mixture of rich loam and leaf-mould, or well decomposed cowdung, till it grows freely. It will then require to be *abundantly* supplied with water, and about the end of May should be placed in a pan of water and put out in the open, if intended to flower there, but I would recommend that they should be grown in the grass-house or orchid-house in the plains. The pans should be so filled with water as to keep them always wet, or the pots may be placed on the edge of a tank, and the plant grown thus as a subaquatic. However it may be grown, the amateur will bear in mind *it requires lots of air, light, shade and moisture*, otherwise the flower will not have the beautiful blue colour that characterizes it.

When the plant has done flowering it should be gradually dried up by withholding water. The pot the Agapanthus is grown in should be 20 or 22 inches deep and 8 inches broad, and the bottom of it one-third filled with drainage. Avoid pouring water over the head of the plant; it should be watered from the side of the pot. It should flower in April or May, sending up a flower stock of two or three feet in height, producing umbels of extremely beautiful, intensely bright blue or white flowers, which blow in succession. After the bulbs have been dried sufficiently when the plant has died down, the fibrous roots may be cut off without injury to them, and they may then be divided to secure the

multiplication and propagation of the species. These plants require care in the plains, but will amply repay the cultivator, for they are truly exquisite and noble plants, combining graceful foliage with large heads of flowers. Seeds may be procured from England, by which they may be propagated by sowing them in pots, in hot-beds, in October, in the plains; or in the same way, but sown in hill-stations as soon as the seed can be obtained fresh. Bulbs may also be procured from any seedsman in England, Holland or in India.

A. Umbellatus: with azure blue flowers of intense color, three feet.

A. Umbellatus maximus: crowded heads of an immense number of flowers, blue, striped with a deeper shade of the same color. The heads of flower are nearly a foot across.

A. Umbellatus alba and *maximus:* white, but much larger than the old varieties.

A. Umbellatus bicolor: blue and white, a fine variety.

A. Excelsus: a gigantic species from the Cape, flower scapes six feet high, with immense heads of blue flowers.

A. Intermedius: flower stems five feet, azure blue flowers.

A. Minor Mooreanus: free flowering, dark blue.

A. Flore pleno albus: with large bouquets of white flowers; double.

A. Flore pleno azureus: the same as the above, with blue flowers; double.

A. Fol argenteis: white striped foliage.

A. Fol aureo vittatis: this is a large variety; leaves striped golden yellow.

I have grown some of these quite easily in pots in the hills with little care, and they are quite hardy planted in the open border. They flower freely: probably better than in pots. If grown in pots they require very large ones, or tubs.

AGATI.

(Nat. ord., Leguminosæ.)

A. Grandiflora. A small tree if allowed to grow, but if kept renewed by seed as a small plant every year or two, is very pretty with its red flowers, which are handsome. *A. Grandiflora flora-alba.* Dealt with in the same way: is handsome and bears white flowers, and in other respects is the same.

AGAVE.

(Nat. ord., Amaryllidaceæ.)

Every one knows the plant Agave Americana, which is so much used for hedges, and which is a harbour for snakes unfortunately. *A. Americana variegata* is a variety of the above. *A. Viviparais* has short stiff leaves, also used for hedges. *A. Americana striata* has striped leaves. *A. Rigida* is ornamental, with narrow leaves. *A. Ixtili* is ornamental. *A. Jacquiniana* has broad leaves. *A. Rigida sisaliana* is much like *Rigida*, but has broader leaves, from which is manufactured the Sisal hemp. *A. Spicata*, a free growing species. *A. Celsiana* is a beautiful species, flowers purplish-brown; also *A. Densiflora*, another handsome species, flowers yellowish-red. *A. Yuccaefolia* has greenish-yellow flowers 1¼ to 1½ inches long, in dense spikes 6 to 15 inches long, scape 12 to 20 feet high, quite distinct from the other. All are propagated by division and seed.

AGERATUM MEXICANUM, &c.—*(Annual.)*

(Nat. ord., Compositæ.)

Of Ageratum there are many varieties; plants all much the same in appearance, but their flowers differing in size of heads and color. This annual is hardy in the plains of India, grows without any particular care in open beds, but in hill-stations will require more care, where they should be sown in March, April or May, and treated as half-hardy annuals.

In the plains, sow the seed in August or September. They are most attractive with their heads of tassel-like blue, white or red flowers. Though they grow, as stated before, with little care, I would recommend the amateur to sow the seed in pots or boxes, and when strong enough, to plant them out in beds or ribbon borders, where they will be in bloom in the cold season, in the plains. Below are a few of the names of good varieties. This flower has been considerably improved, like many other annuals.

A. Mexicanum: blue, is an old variety.
A. Copes gem: deep blue, dwarf.
A. White cap: fine white, contrast to the above.
A. Swanley blue: deep blue, dwarf.
A. Little Dorith: azure blue.
A. Lady Jane: pale blue, very dwarf.
A. Lasseauxi: rose color.

AGLAIA ODORATA.

Nat. ord., Meliaceæ.

A shrub about three feet high, with smooth, deep green pinnate leaves and five or six shining leaflets, and bearing small yellow flowers in axillary racemes, which are very fragrant. These are borne at various times during the hot and rainy seasons. This is a handsome plant, the flowers of which, it is said, the Chinese use for scenting their teas. Propagated by cuttings taken off at a joint, will root readily in sand under a hand-glass.

AGLAONEMA.

Nat. ord., Aroideæ.

The plants are allied to Arum and must be treated in the same manner, but in grass conservatories, in a compost of leaf-mould, old mortar, crocks, sand and loam. In the hills they will require the protection of a glass conservatory.

A. Commutatum. A. Laville. A. Manii. A. Nobilis. A. Pictum. A. Gracile. Propagated by division and cuttings inserted in sand under a hand-glass.

AKEBIA.

Nat. ord., Lardizabalaceæ.

A. Quïnata. A very pretty twining shrub, bearing purplish-brown flowers, which are small and produced in axillary racemes. Its leaves are very sweet-scented and are borne on very slender petioles, palmately divided into five distinct leaflets of oval form, the bottom pair being smallest. Native of China.

ALBUCA.

Nat. ord., Liliaceæ.

These are pretty Cape bulbs which do well in a light soil mixed with leaf-mould. *A. Aurea*, yellow and green. *A. Canaliculata*, pure yellow, very sweet-scented. *A. Fastigiata*, white and green. *A. Filifolia, major* and *minor*, yellow and green. *A. Nelsoni*, pure white, very fragrant, a high-class novelty. They should be grown just like Ixias and Sparaxis.

ALLAMANDA.

Nat. ord., Apocynaceæ.

A most extensive genus of flowering shrubs of great beauty; easily propagated by cuttings put under a bell-glass in sand, or sand and soil. Some of the varieties have flowers fully five to six inches across, and are extremely handsome. Their flowers are of shades of yellow, orange, chocolate or red. The plants flower in the hot and rainy season, and their branches should be well thinned and cut in during the cold season, both in the hills and plains of India, when cuttings may be struck in the plains (not so easily in the hills), and when the weather grows warm may be removed to open beds, where they thrive best, or may be kept in large pots. In the plains these plants are hardy, and resist the hot weather if

properly watered, and grow in almost any soil, but flourish best in rich loam manured with leaf-mould, and cow-dung, or night-soil. In the hills they require the heat of a conservatory, and do not do in the open, except at low altitudes.

A. Alamanda aubletii, yellow.
A. Cathartica, yellow.
A. Nerifolia, yellow.
A. Schottii, large-flowered, yellow.
A. Violacea, purplish.
A. Williamsii, yellow, scented, a new variety.

ALLIUM.

Nat. ord., Liliaceæ.

These are very pretty bulbous plants, easily grown in a light soil in the hills and North-West Provinces. They require good drainage. Plant in the North-West in October, and in the hills in November, and close of February or March. *Allium giganteum* is a remarkable plant, the flowers being borne in huge globose heads, bright rose purple, three to four inches in diameter. This is new, as also the following:—

Allium amblyophyllum, rose, broad leaves, 1½ feet.
A. Neopolitanum bears white flowers in umbels. This is the commonest kind.
A. Molly (Luteum) bears trusses of golden-yellow flowers.
A. Striatum, white striped, distinct.
A. Rosenbachianum, large purple-rose flowers, 1½ feet, rare.
A. Ostrowskyanum bears upwards of 40 flowers in an umbel, rosy scarlet.
A. Azureum, deep azure blue, 2½ feet high.
A. Murrayanum, rose.
A. Pulchellum, rosy violet, in umbels. There are a great variety of these.

They increase rapidly by tubers, and are of the easiest cultivation in the hills, either in the border or in pots, being quite hardy. They should do in Bengal planted in October, but I have not tried them there.

ALOE.

Nat. ord., Liliaceæ.

I need hardly describe this plant; almost every one knows it, speaking of it generally as the Aloe; but there are many varieties, which induce me to mention the names of a few most deserving a place on the lawn or garden, while some are handsome in pots. They all enjoy a light soil, well drained, and endure extremes of temperature, but prefer heat to cold, and drought to damp.

A. Indica has thick and soft leaves, with edges of thorns. Pale green leaves with spots. Its flowers are of a dull red color. A pot plant.

A. Barbadense, perifolia and *serrulata* are other varieties suitable to pot culture.

A. Intermedia and *A. Saponaria*, leaves dotted white.

A. Attenuata, described as having "curiously crimped leaves."

A. Abysinnica, a large plant with vermilion flowers.

These plants are propagated by division of their roots.

ALOCASIA.

Nat. ord., Aroidaceæ.—(Ornamental foliage.)

A species of the Aroid family, with lovely foliage, of which many varieties have been newly introduced into this country. Being of perennial habit, it is of great value in

the conservatory: with its noble, large, and grand colored leaves, few, if any, ornamental foliaged plants can rival it. It enjoys a light soil with *good* drainage in the pots or tubs in which it is grown, and must also have a certain amount of shade, such as the orchid or grass-house could afford it. Propagated by division of the roots. *A. Cuprea*, leaves rich bronzy purple beneath.

Alocasia metalica. An old variety with beautiful green leaves of immense size, suffused with bronze: the lower surface of the same being of a reddish purple.

A. Lowii. With immensely large sagittate shaped leaves margined with white; the lower surface purple.

A. Thibautiana. A new variety which stands among the first rank of foliage plant. Leaves firm and durable in texture, of a deep olive green, the midrib and veins being of a greyish white.

A. Johnstoni. Leaves are long, and prettily variegated, veined rosy red on olive green.

A. Reginæ. Quite a new introduction: has immense leaves of a fleshy texture, of a glossy greyish green on the upper surface and purple underneath, the peduncles a polished pale green, spotted with purple. A native of Borneo, discovered in 1883.

A. Sanderiana. Quite an acquisition among this class of plants, and a truly beautiful one of the finest Arads. Introduced from the Eastern Archipelago. Leaf peltate and sagittate, pinnatefiedly lobed dark green and glossy, blotched with darker bottle green; the older leaves having a metallic blue lustre. The thick costa and stout cross veins are white, and are bordered with white. *A. Scabriuscula*, leaves bold and large, 22 to 31 inches, height 4 to 4½ feet.

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A. Macrorrhiza, Variegata, Violacea, Veitchii, Gigantea Zebrina are all older varieties and very well known. Propagated by division.

ALONSOA.—*(Mask flower. Annual.)*

Nat. ord., Scrophularinea.

A neat plant, with strangely shaped flowers. *A. Incisifolia*, scarlet. *A. Linifolia*, deep rose pink. *A. Warscewiczii*, scarlet. *A. Grandiflora*, large flowering scarlet, not so profuse blooming. *A. White gem*, new, with white flowers. They require no particular treatment, and succeed in almost any soil, just as other annuals, but should not be crowded together. Grown as single specimens, they do well. Sow in the plains in October, and in hill-stations in March or April, in pots; prick out when strong enough and plant as single specimens.

ALOYSIA CITRIODORA.—*(Sweet-scented Verbena.)*

Nat. ord., Verbenacea.

Every amateur must know the sweet-scented Verbena. The garden is not complete without it, with its pretty light-green foliage and cheerfully-refreshing appearance. When properly grown in a rich and well-watered soil of loam, mixed largely with leaf-mould, it is a charming plant in appearance, and for its sweet-scented leaves. The flowers of this plant are very insignificant. I have grown it in great perfection in the open beds of a garden, taking care to enrich the soil around its roots with a surface-dressing twice or three times a year, occasionally watered with liquid manure. I think they are best renewed annually by cuttings, put in sand under glass in October, in the plains, and in April or May in hill-stations, where they will hardly even droop. The cold weather sometimes kills them in the western plains of Bengal, so low down as Behar: for this reason I would recommend them to be taken up and put into pots suitable to their size before cold weather has set in, so as to allow them to be protected from cold, in a verandah,

glass-house, or grass-house, and to establish themselves well, before it is too cold for them to grow or recover themselves. I have had Aloysia of two years' growth as high as seven or eight feet in Behar. It is also obtained from seed which is imported. It would appear contradictory to the above statement, that they sometimes die off with the cold weather in the west of Bengal, when I state I have seen them withstand the cold in Mussoorie, planted in a bed in the open garden, but such is the case. They entirely lose their leaves in Mussoorie, but revive again in spring. Sometimes they are entirely cut down by frost, but spring up from the root again by March or April.

ALSOPHIA.

Nat. ord., Filices.—See ferns.

ALSTONIA.

Nat. ord., Apocynaceæ.

A. Nereifolia, or Oleander-leaved Alstonia, bears flowers of a star form, which are white. Its leaves are somewhat broader than that of the Oleander. A nice shrub.

A. Macrophylla is like the above, but with larger leaves.

A. Scholaris has white salver-shaped flowers. Leaves much like the above, *syn. Echites scoholoris.*

ALPINIA.—*(Foliage and flower.)*

Nat. ord., Zingiberaceæ.

A large genus of handsome foliage plants easily propagated in the plains by division of the roots, which are fleshy, branched and having the smell and taste of ginger. They require a very rich light soil and copious watering. Frequent watering with liquid manure is beneficial to them when in growth. If well cultivated they bear terminal flowers; they require lots of pot room. During the cold season, or when they have done flowering, they should be allowed to rest. The best time to propagate them is when they have made an inch of growth.

A. Albo. lineata, leaves pale green with oblique bands of white.

A. Mutica, flowers white with yellow lip.

A. Nutans, flowers pink, sweet-scented, in drooping racemes. Should be cultivated in clumps: a native of India.

A. Vittata, leaves pale green, striped cream, color very handsome.

ALSTROMERIA.—*(Bulbous or fibrous.)*

Nat. ord., Amaryllidaceæ.

A most curious genus of plants, their leaves taking a twist near their stalk. Their roots differ in different varieties,—some are fibrous, while others are bulbous. *A. Psittacina* has bright crimson flowers, and the ends of their petals are of a green color, and some are spotted with orange; very beautiful when in full bloom in March. *A. Van Houtti*, colors various, of almost every tint—lemon, scarlet, pink, red, etc.; variegated. The tubers should be placed in rich sand and loam, and watered freely. They should be grown in large-sized pots, in light rich soil in partial shade, and allowed to die down after flowering by lessening their water supply. These plants will grow in the plains, but are much better in hill-stations in this country.

I would recommend the frame varieties as most likely to succeed in the hands of amateurs, such as mentioned below.

A. Acutifolia, flower orange, pointed black, outside green, shaded.

A. Hæmantha, scarlet, purple and orange, very charming

A. Hookeri, orange, scarlet.

A. Oculata, rosy purple, dark spots.

A. Palida, white.

A. Pelegrina, very handsome large flowers, outer segments pale purple, inner segments white, suffused yellow, spotted purple.

A. Pulchella (Simsii), purple, tipped sulphur-yellow and purple, spotted and striped.

A. Revoluta, novel large bouquets of orange-red flowers.

A. Tenifolia, a rare variety, white, cream and yellow, beautiful. The hardy kinds mentioned: varieties—*Psittacina*, *Van Hotti*, *Brasiliensis*, *Chillensis*, *Oculata*, and *Aurea*. *Aurantiaca* may not flower in the plains, or be uncertain. The frame varieties first mentioned are much more likely to give good results in the plains, and do well in hill-stations. Plant the tuberous-rooted hardy kinds six inches deep, in a light loamy soil, well drained. The frame varieties should be planted in the same sort of soil or compost, and should be freely watered, but when resting, water must be diminished. They flower in summer. The difficulty is to get these bulbs in proper time for the plains, as they should be put down in October, and are not ready in Holland till August. The only way is to put them down as soon as received, either in the plains or hills, and if they do not flower the first year, they will the following season.

A Brasiliensis. Flowers amaranth red on stems about three feet high, tips of petals green, and the entire surface of the flower is marbled with black. Will only do in the hills.

A. Chillensis. With flowers varying scarlet to white, borne in long racemes. Will only do in the hills.

A. Oculata. With rosy purple flowers, spotted black, is a frame variety.

ALTERNANTHERA.

Nat. ord., Amaranthaceæ.

Small plants with pretty variegated and colored leaves, they are largely used for edging flower beds, for which purpose they are most suitable, easily propagated by cuttings in the rains, and in October if watered well. There are three varieties of these—*A. Discolor*, *A. Paronychoides* and

A. Spathulata. In the hills at high altitudes they are not hardy.

ALTHÆA.—*(Hollyhock. Biennial.)*

Nat. ord., Malvaceæ.

In England and on the Continent we consider this one of the very finest ornaments of a garden, but in this country, somehow, the flowers are *generally* single in the plains. In the hills I have had lovely double flowers. I will describe how they should be grown. So much has been said about the degeneration of flowers in India, in general, that it is worth while making some remarks on it. Who has seen a more beautiful object in an English garden than the stately, tall, and tapering stalk of this noble plant, high above all others, covered with its rich and variously colored rosettes of flowers clinging round it? And then compare it to the poor single-flowered apology for it, seen sometimes in India. A lover of gardening would say—Oh! how changed; who could say otherwise? And much of this is brought about from want of care in cultivation, selection of proper flowers to get the seed from, and acclimatization.

The seeds should be chosen from the most perfect plants, which have "*round flower florets, thick and smooth on the edge*," "color dense," "and the flowers close to each other on the stem." Sow the seeds in March and the beginning of April, or in October in hill-stations, and in the plains at the end of the rains, *not* in the beginning of the rains. The soil should be rich in manure, and such as would suit a cabbage, or even be perhaps a little too rich for that esculent. Trench the bed thoroughly, *turning the soil thoroughly: break it up and smooth it.* And in this sow the seed so as to come up an inch apart: after which scatter some rich dry soil over it, so as to cover it for an inch, then press it down gently. Keep the bed well weeded and the surface soil stirred up, *and encourage growth* by frequent watering in dry weather. Never

let the bed be very dry. In a month or a month-and-a-half, the plants should be fit for transplanting to a nursery bed, which should be of the same rich soil as the seed-bed, or richer, certainly not poorer. Should the seedlings have been properly treated, the roots will be large; these should not by any chance be broken in taking up. Drench the bed a night previous to transplanting, and take up the plants with a fork or deep spade, and plant them in the new bed eight inches apart with a dibber, making the hole large enough for the root. They should then be watered. Keep the earth well stirred up, and prevent insect attacking the plants. When the plants are from two to three feet high, transplant them in rows, or where they are to be, in rich soil. *At least* some of these will yield double flowers. In the last transplanting they should be placed a foot apart in rows, and all other plants be removed from near them. Tie all their stalks together with strings, and support them with stakes. When they flower, *all single flowers which do not shew themselves worthy of being kept, should be taken off, or the plant should be dug up altogether, and it will be found a majority will share this fate, yet some will escape.* The flowers selected must be chosen for some desirable character, of habit, or color: from these, collect your seed for further experiment next season. Should you keep the old plants for next season, they should, after flowering, be cut down to within three to four inches of the ground. Dig well round their roots and surface-dress them. Number them, and take note of them for their various qualities.

In propagating from cuttings, all side shoots which have no flower buds should be taken as soon as the first flowers have opened on the mother plant, with about three joints cut just under the third bud; cut it also about two inches above the joint, leaving the leaf entire, and either joint will do if it has a growing eye, and some ripe wood to support it, till it throws out roots. Place these cuttings under glass in a light sandy soil, and treat them as you do other cuttings, shaded

from the sun, etc. In hill-stations put them under shelter from severe weather.

Mr. Paul, of Cheshunt, who has made the hollyhock his study, says their period of flowering may be extended by striking and transplanting at different seasons. He says: "There is a difference of six weeks in the period of flowering between plants removed early in autumn and late in spring; and of this we may avail ourselves to lengthen the succession." "Early-rooted cuttings and old plants may be induced to bloom in July, and late-rooted cuttings and spring-grown seedlings in November, hence there is no difficulty in obtaining flowers for four successive months." This could be done to a certain extent in hill-stations as it is in England, and in the plains; a little knowledge of gardening would guide the amateur with good sense to help him. I have had double flowered hollyhocks of superior varieties myself from acclimatised seed. Care only is required in culture and selection. When the plants are turned out permanently, it is most important that they be well watered, to promote growth. Three flowering spikes only should be left to the strongest plants, and to weakly ones only one.

Some plants will grow to over 12 feet high. They are seldom grown in named varieties now, as old plants are liable to disease, and if they are grown from old plant of named varieties, it is from cuttings and offsets. There are several good strains of seed to select from: Chater's is considered one of the best. For small gardens there is a splendid strain of dwarf habit, a novelty sent out by Peter Henderson & Co., New York, namely, *Dwarf Japanese Hollyhock*, only 15 to 18 inches high. They also send out under the name of *new hardy mammoth-flowering Hollyhock* a very good strain of semi-double flowers not regularly arranged: and the old grand *double hollyhock*. I refer the amateur to what Dr. Bonavia most correctly says on the acclimatization of seeds, in the Journal of the Horticultural Society of India, Part III.

AMARANTHUS.—*(Annual.)*

Nat. ord., Amaranthaceæ.

Amaranthaceæ are of many varieties, and new descriptions are sent out with imported seed yearly. Most of them are plants with ornamental foliage, as *A. Tricolor,* with leaves green, yellow and red; *A. Oleraceus, Ruber,* and others, while *A. Caudatus* and *Hypochondriacus* have not only red leaves, but feathery plume-like tufts; the former better known perhaps as "Love-lies bleeding;" and the latter as "Prince's Feather." These plants grow easily in almost any soil. Sown in poor soil, they do better in this country, as they grow rank and tall in rich compost, and then lose their color to a certain extent; in hill-stations, they should be sown when the weather is warm enough in April, May and June: in the plains from September to November, when the cold is not too great for them.

A. Bicolor Ruber. Very brilliant.

A. Henderi. Foliage red, orange and gold, and olive green. Drooping.

A. Margaritæ. Novel and distinct, flowers upright and crimson, one of the best.

A. Melancholius Ruber. Dark.

A. Salicifolius. The fountain plant. Drooping, banded, leaves orange, carmine and bronze.

A. Prince of Wales. Not Prince's Feather, very good, one of the best.

A. Pyramidalis Nobilis. With a flower at apex, and at the ends of branches, of purple.

AMARYLLIS.—*(Bulbous.)*

Nat. ord., Amaryllidaceæ.

These are very pretty flowers, of large size, borne on a scape of from one-and-a-half to two-and-a-half feet high. There is a large variety of them, considering too that the entire Hippeastrum family are included among them. They are most

easily cultivated, and a succession of bloom may be kept up with management throughout the season. Their flowers are trumpet or bell-shaped and lily-like, and their colors range from the richest crimson to pure white. They are striped too, crimson and scarlet, pink and white, etc., etc. The Amaryllis is chiefly a native of the Cape of Good Hope and South America. *A. Reginæ Mexicana* is found commonly in gardens in this country in open beds: flowers orange red, produced in March and April in the plains. *A. Zeylanica*, of which the flowers are very handsome, flowers about the same season as the last. *A. Formosissima* has beautiful dark red flowers of singular structure; three petals well expanded above, and three others turned down over the fructile organs. It blossoms in April and May. *A. Insignis*, a tall variety, having pink flowers in March and April. *A. Latifolia* bears pinkish white flowers; *A. Belladonna*, moderately high stem; pink or pale blush flowers of the same singular form as the Jacobæa lily, in May and June. They are of easy cultivation. Grown in pots or tubs, they do well with a light soil and good drainage. Two parts light rich soil and one part leaf mould suits them well. From the time they start into growth, they should be copiously supplied with water, and when they have done flowering, it should be withheld. I think, after the leaves have died down, the bulbs are best left undisturbed in their pots till January, when they should be taken up, divided and repotted afresh, leaving the half of the bulb out of the soil, or rather less. Propagate by offsets which come up freely. There are a large number of new varieties produced by hybridising during late years.

A. Belladonna blanda, white.
A. Longifolia alba, white, sweet-scented.
A. Longifolia rosea, rose, sweet-scented.
A. Lutea, yellow.

These last-named four sorts require shade for at least six hours from the midday sun when grown in the plains.

A. Aulica, reddish brown with greenish stripes, flowers very large.
A. Cleopatra, dark red, margin white; very showy.
A. Crocea, vermilion.
A. Crocea superba, orange; large flowers.
A. Prince of Orange, orange; very handsome and large.

Newer varieties are *A. Countess of Dufferin*, introduced by Messrs. S. P. Chatterjee & Co., Calcutta, flowers described as abundant, of a bright scarlet color, with ivory white centre. *A. Dr. Masters*, one of the finest, bright carmine scarlet shaded towards the base purplish crimson.

A. Empress of India, a very large flowering variety, flowers glowing scarlet tinted with orange, white eye and white central stripe on each petal. The varieties are very numerous. *A. Halli* is quite hardy in the hills, cold suits it, rose color with blue, flower in autumn. The Hybrid Amaryllis, of which many are reared at the Saharanpur gardens, are not suited to high elevations, being too tender, but they thrive splendidly in the plains. The show Amaryllis (Hippeastrum) are in great variety, are of easy culture, and some of them (I may say most of them) are hardy. They are expensive, of most diverse color and most regal habit. In the hills plant in March or April. In the plains plant in January. This applies to all varieties.

AMHERSTIA NOBILIS.—*(Ornamental tree.)*

Nat. ord., Leguminosæ.

A tree considered by some, as Firminger says, "the most beautiful object in the whole vegetable kingdom." I consider it too large for most gardens. Its flowers are in large and pendulous clusters of red and yellow, and are really lovely. It is, however, far too tender to suit a hill climate. Propagated by layers. It cannot stand frost, and does not even suit the North-West Provinces,

AMORPHA.

Nat. ord., Leguminosæ.

A genus of rather handsome shrubs. *A. Fruticosa:* the false Indigo, has flowers of a very dark bluish purple, and the plant is something like the Indigo plant. *A. Canescens:* the lead plant, bears dark blue flowers. Its leaves are hoary. Of the first species there are several varieties, differing slightly, so little indeed, that it is needless to enumerate them here.

AMORPHOPHÀLLUS.

(Nat. ord., Aroideæ.)

Very curious plants allied to Arum, but differing on account of their spreading spathe, and by their anthers opening by spores and not by longitudinal slits. A soil of two-thirds rich loam and well-decayed manure suits them. They require lots of pot room and a temperature ranging from 55 to 70 degrees. In winter they must be kept dry and warm. Damp destroys them. They are difficult to propagate. They have a nasty smell, and are most offensive, but being so curious, are grown. They are even pretty, and the flower of *A. Titian* is the largest flower in the world, as the following description will show: "Spadix five feet high, black purple; spathe nearly three feet in diameter, campanulate in shape, with patent and deeply-toothed edges. The deeper portion of the interior is pale greenish, but the limb is of a bright purple hue: the outside is pale green, smooth in the lower portion, but thickly corrugated and crisp above: scape about 7½ feet long, green, marked with small whitish orbicular spots." The leaves are much divided, and cover an area of 45 feet in circumference. A native of Sumatra. Several species are natives of this country, but these are pigmies in comparison to *A. Titian. Syn. Conophallus Titianum, A. Kingii, A. Riveri, A. Laconrii, A. Grandis, A. Campanulatus* have been grown in India, and are of easy culture in our grass conservatories.

AMPHILOPHIUM.

Nat. ord., Bignoniaceæ.

A. Mutisii and *A. Paniculatum.* Climbers too large for ordinary private gardens, reaching the tops of the highest trees. The first with deep purple flowers, the second with rose-colored flowers.

ANÆCTOCHILUS.

Nat. ord., Orchidaceæ.

Of these it is said "the leaves are the most beautiful in the world:" being all more or less dwarf plants of compact growth, they do not occupy much space and are superb for decorating the table.

Care being taken that they are not over-watered during their season of rest, more success might be gained in its cultivation. For the following quotation for its cultivation, I am indebted to the "Indian Gardener," which aptly describes its treatment: "As soon as the plant begins to move, which will be about February, they will send up a flower spike which should be removed with the point of a knife, an operation that causes the plant to break at every joint." "As soon as these young shoots have made about an inch of growth, take a knife and cut the old stem through, between each joint, remove each piece carefully without injury to the roots, and pot off either singly into small pots or several in a pot of suitable size, placing them under a bell or hand-glass till thoroughly established." "The pots used should be filled to within two inches of the rim with broken potsherds, covering this with a layer of fresh moss (or if this is not available, cocoanut fibre). The pots should then be filled with a compost of equal parts of leaf mould, silver sand, broken brick and charcoal; the two latter should be broken to about the size of peas." "Should there be any sign of decay after potting, cut it away at once, sprinkling a little fresh lime over the cut; this will prevent further damage." "Give water and air sparingly at first; let them have all the light

possible, but shade carefully from the sun; never water them overhead, as the water is liable to get into the axis of the leaves, and frequently cause them to damp off." There are over thirty kinds in cultivation, of which I quote the following, which are the best:—

A. Sowii is the largest of this genus and stands about 6 inches high. Its leaves are of a velvety green, of a dark color, shaded to yellow, orange and brown in line from stock to point, and the entire leaf is intersected with veins of the same color. Length of leaf 5 inches by 3 inches in breadth.

A. Argenteus (Physurus), leaves 2 to 3 inches long, green, veined with silver.

A. Argenteus (pictus), leaves 3 to 4 inches long, green, edged with a band of silver down the centre.

A. Maculatus, with dark green leaves "spotted with white parallel with the midrib."

A. Petola.—Leaves green, 2½ inches long, intersected with golden veins. A strong variety, which rapidly increases.

A. Striatus.—Leaves dark green, 2 to 3 inches broad, with white down the centre.

A. Intermedius.—Leaves 2 to 3 inches long, dark olive green, velvety, veined with gold.

A. Setaceus.—A very handsome old kind, of which there are several varieties, leaves velvety green, veined with gold.

A. Xanthophyllus.—A distinct variety, height 4 to 5 inches, leaves 2 to 3 inches long and 1½ broad, dark velvety green, striped orange and green down the centre and covered with gold veins.

A. Dawsonianus.—Leaves almost black, veined with crimson, flowers white.

A. Ordana.—Leaves green, veined gold.

ANANASSA.

Nat. ord., Bromeliaceæ.

The variegated leaved pineapples are handsome plants for ornamenting conservatories. *A. Striata*, the Malacca

pineapple, has leaves marked longitudinally with light yellow, red and deep green. *A. Porteana*, leaves deep olive green, with a broad band of pale yellow running down the centre. *A. Macrodonta*, leaves with large teeth along their edges; not so ornamental as the first two.

ANDROPOGON.—*(Lemon Grass.)*

Nat. ord., Gramineæ.

A. Schœnanthus or Lemon Grass, only cultivated for its finely scented leaves, which emit their odour when bruised. Syn. *A. Citratum* grows easily in any ordinary garden soil.

ANEILEMA.

Nat. ord., Commelyacea.

A genus resembling Commelyna. *A. Nudiflora*, mentioned by Firminger, but I have not seen it. *A. Biflora*, flowers blue. Leaves lanceolate. A creeping plant, has not been introduced. Readily grown on the plains, but requires to be grown under glass in the hills.

ANEMONE CORONARIA.—*(Florist's Anemone.)*

(Tuberous-rooted plants.)

Nat. ord., Ranunculaceæ.

The Florist's Anemone is a charming plant, of small growth, bearing exquisitely pretty cup-shaped flowers, both single and double, of numerous colors. The seeds may be sown at the approach of the cold season in the plains, and in the early spring in hill-stations. Tubers may also be imported. They should be planted in October in the plains, and in the hills in January or February. Both tubers and plants grown from seed wear out, unless very carefully managed, and freely supplied with liquid-manure. They should be grown in a light rich soil, mixed with leaf mould. The seeds should be sown about an inch deep, and if tubers are planted, a little silver sand should be put in under the bulb, in the hole in which it is planted. Water slightly

at first in the case of bulbs, then freely when they appear above the soil, or keep the plants in a pan of water up to one-third in the pot containing the plants. The pots should be most carefully drained, and watering now and then be given of liquid manure when they are in growth. In selecting tubers, pick moderate-sized and plump ones, the larger-sized ones being generally hollow. A perfect flower should have its petals start away from its centre nearly flat, and then turn up at the ends, so as to be the shape of a cup: the different colors should be distinct and clearly defined. The double varieties are the finest, but there are some single ones exceedingly beautiful. Seeds should be procured as fresh as they can be got, and sown as soon as received, for they will not stand exposure in this climate. There is a caterpillar that does great havoc among these plants which requires careful watching. Every few days, examine your plants, or you will lose them, as this pest is voracious, and quickly does much harm. When found pick off and destroy it, is all that can be recommended. Fulgens is the single scarlet wind flower of the Riviera. French mixed Giant Varieties are single, and embrace a wide range of color. There are also the French double of various colors and *Fulgens multipetala*, scarlet only. The above may be obtained from the Himalayan Seed Stores, Mussoorie, as also the *Chrysanthemum* flowered, of mixed colors, the flowers of which are double and fringed. A new variety that I do not think is generally known in this country, is *A. Fannini*, with white flowers and Rhubarb-like leaves. This variety is quite hardy with a little protection in the hills. It was pictured in the "Gardener" some years ago.

ANGELONIA.

Nat. ord., Scrophulariaceæ.

A. Grandiflora and *A. Salicicariæfolia* bear nearly at all times terminal racemes of blue flowers, which are hairy. The latter has rather willow-like leaves. The flowers have rather a disagreeable odour. Propagated by cuttings during the rains.

ANGRÆCUM.—*See Orchids.*

ANISOMELES.

Nat. ord., Labiatæ.

A. Furcata, a Nepal species with elegantly variegated flowers, white, red and purple, in many flowered racemose cymes. Leaves ovate acuminate 4 to 5 feet high. *A. Ovata* with purple flowers, the lower lip deeper in color, many flowered, in whorls, leaves ovate obtuse 2 to 3 feet high—this is also a Nepal species, an annual; the first a perennial.

ANTIRRHINUM.—*(Snap Dragon Hardy Perennial.)*

Nat. ord., Scrophularinæ.

The new varieties of this popular flower are exceedingly handsome and of brilliant colors. They grow with little care in almost any garden soil, being a hardy perennial. They flower in India during the first year of their growth, but are much handsomer if prevented from doing so, by pinching off their flowering spikes, till their second season. However, by so doing in Bengal Proper, one has the chance of losing them, though in the North-West Provinces, and hill-stations, they have greater chances of outliving two seasons. They are most useful border plants, and when kept over till the following season, should be transplanted into *rich and newly manured soil*, taking care not to injure their roots, and to aid in doing so, drench the soil well the day before attempting it, as their roots strike down deep into the earth. If protected from heavy rain, they live in the plains till the following season. In Darjeeling too they require protection from heavy rain to be kept on till the following season. In Mussoorie I have seen them live on for years without any care under the wall of a house slightly protected by the roof. These perennials have been very much improved during late years, and are beautifully striped and spotted in all the several colors, except blue, in both the tall and dwarf varieties.

Seed should be sown in the plains in October, and in hill localities in October or November, and kept under cover till spring, or from April to May. When large enough, the seedlings should be picked out and planted a foot apart, and less if they are of dwarf varieties. The sowing of country or acclimatized seed should be encouraged, as if the seeds are collected from plants selected, and kept separate from others of different colors, they do not deteriorate. It is simply natural, that when flowers of different colors are all grown together, their colors, originally brilliant, become of one ordinary color through close affinity to one another, and fertilize each other. This heterogeneously colored and fertilized seed is sown again, some of the plants follow their originals, *but the majority turn out worthlessly dull in color*, and are then called degenerated. Is this the fault of the cultivator or of the climate? I should say the former is to blame, and perhaps the amateur as well as the professional reader of these pages will agree with me. A bed of these alone is lovely in separate colors, such as can be got from seedsmen in India, or from home growers. Cannell & Co., Swanley, Kent, have a very fine strain of both the dwarf and Majus varieties. The Himalayan Seed Stores sell the Majus variety in separate colors.

ANTHERICUM.

Nat. ord., Liliaceæ.

A. Liliago (St. Bernard's Lily), flowers pure white 1 to 1½ inches across. Leaves tufted, long, narrow, channelled to 1½ feet.

A. Liliastrum (St. Bruno's Lily), flowers larger than the last, 2 inches long, and as much across, transparent white and sweet-scented, with a green spot on each segment: bell-shaped, in loose spikes. Leaves long and narrow 1 to 2 feet.

A. Ramosum, smaller than *Liliastrum*, white, flower stem branching. Leaves much the same as *Liliastrum*. These plants will be found to do better in the hills than in the plains. Propagated by division.

A. Variagatum, a variety with leaves striped with white on the margin.

ANTHURIUM.

Nat. ord., Aroidaceæ.

Most noble and beautiful plants are these, and it is indeed a fact that has been said of them (or rather I may say of one of them), namely, of *A. Crystallinum*, that it is "the grandest foliage stove plant known." On first seeing these plants, I was at once struck with their great beauty. Not only are they plants with grand foliage, but some such as *A. Ornatum* has both beautiful foliage and flowers, and what plant can indeed boast of both features to recommend it to the eye of horticulturalists? They are easily cultivated, if allowed a free and open soil, and also good drainage. They must also, like all Aroids, have a certain amount of shade, such as a grass house or orchid house would afford them. In treating those of the ornamental foliage section, it is very necessary to remove every flowering spathe that may appear, or otherwise the size of the leaves will be greatly diminished, so much so that they may not attain even half their size. They should be grown in pots placed within other pots: the space between being filled with earth which should be kept moist: or the pots may be plunged into earth, which perhaps is better. Wood being a good non-conductor, tubs are most suitable to grow them in. The following compost has been found most suitable to them:—

Leaf-mould	...	...	12 parts.
Well baked fibrous turf	...	...	8 „
Spent tan or bark	...	...	4 „
Coarse sand	...	...	4 „
Moss, chopped fine	...	...	4 „

If moss cannot be obtained, then cocoanut fibre refuse must take its place; but in no case where the former is required can the latter be as good.

There has been considerable difficulty in propagating these beautiful plants, which is effected in two ways: first, by removing the lower leaves of the plant with the leaf bud and one or two of the roots adhering to the back of it. The leaf stalk clasps a good way round the stem, so that the knife must be inserted considerably above the bud and brought out below it with a semicircular cut, and the bud and leaf with the roots attached should at once be planted in suitable ring pots, one in each pot, and then covered with a bell-glass, and kept thus for about a month, by which time the bud will have thrown out leaves. The second method, though apparently more hazardous, is considered quite as good, and is proceeded with thus: Remove the plant from the pot it is growing in with as little injury as possible to its roots; cut off the old stem, or what is known generally to amateurs as the tap root, and at once re-pot it, placing the pot in a cool and sheltered situation.

Then proceeding with the part of the stem removed from the old plant, cut it into pieces, each piece having an eye and at least a root attached to it; each of these should be placed in a pot singly with a bell-glass over it, and kept so, as before recommended, for one month.

By this process, an immense number of plants can be propagated from a single old specimen, as many, it has been remarked, as from ten to twenty young plants have thus been reared.

FLOWERING SECTION.

A. Ferrierense.—A plant of very recent introduction, of which the flowers are a bright rose color, and which lasts for a long period without withering. This plant is a hybrid between *A. Andreanum* and *A. Ornatum*, and was raised near Paris by Mr. Bergman, gardener to Baron Alphonse de Rothschild.

A. Andrianum, also of recent introduction. The flower spathes are heart shaped, of a brilliant scarlet, the surface

being corrugated; spadix 2 inches long; ivory white at the base, greenish at the tip. The flowers remain in perfection for nearly three months, which make this plant undoubtedly valuable.

A. Ornatum.—This wonderful plant has both ornamental foliage and flowers, and is said to be unsurpassed in beauty, as it combines both features. Its petioles are 3 feet long, leaves light green and cordate, from 9 to 12 inches broad: flowers thrown well above the foliage; spathe pure white, from 6 to 8 inches long by 2¼ in breadth, tapering to the apex, and is sweet scented. Spadix 6 inches long, and black covered with a violet hue.

A. Scheizerianum.—Leaves 12 inches long, only 1½ broad. Known as the flamingo plant in England: is a native of Costa Rica. Its flowers are of a bright scarlet and retain their brilliancy for nearly three months.

A. Bakeri.—The spadix is a lovely pink and scarlet: rachis pink and fruit scarlet, about the size of peas.

ORNAMENTAL FOLIAGE SECTION.

A. Crystallinum. has very beautiful large leaves, which are of a deep olive green, the midribs and veins of which are bordered with a white silvery band. The younger leaves have also a bronzy tint.

A. Crystallinum Williamsi.—With foliage much the same as the foregoing, but with longer leaves and the marking of the veins more distinct.

A. Harrisii Pulchrum.—A native of Brazil. Leaves long, lance shaped, rounded at the base, of a pale green color, closed flecked with deeper green and silvery variegation. Scape a foot long, bearing the white spathe, pink at the top and surrounds the crimson spadix.

A. Insigne.—A very striking and noble Aroid. Leaves trilobed and green, when young having a bronzy tinge; each leaf has several longitudinal ribs in each lobe.

A. Macrolobum.—A beautiful variety: has a short thick stem and dark green leaves with about five pale green ribs, cordate in outline; apex accuminate: an open pissus at the base with three distinct marginal lobes.—This variety is of hybrid origin.

A. Splendidum.—Distinct from others in cultivation. Leaves cordate in form with an irregular surface, the lobes meeting behind the source of the nerves, marked with a broadish band of velvety green, the intervening spaces pale yellowish green. A strikingly beautiful variety.

A. Veitchii.—Leaves ovate oblong, much elongated, from 2 to 3 feet, with a breadth of one-third of the first-mentioned dimension: color deep velvety green and glossy metallic lustre, becoming paler with age.

The nerves arched and deeply sunk, or coriaceous in texture. This variety is a native of Columbia.

A. Warocqneanum.—One of the finest Anthuriums in cultivation, if not the finest. Leaves much elongated, 24 inches to 30 inches long by 7 to 9 broad; of a deep velvety green, of rich lustre; the color of the midrib and veins being a light green, enhances their beauty greatly.

ANTIGONON.—*(Creeper.)*

Nat. ord., Polygonaceæ.

A. Leptopus is well known in our Indian gardens in the plains, with its lovely rose-colored flowers and bracts ending in a tendril. The leaves are alternate cordate and peteolal. They flower for a long period with a mass of bloom. Propagated by layering and by seed.

A. Insigne is less known, each sepel is about 1 inch in length. The leaves are broadly ovate oblong, 4 by 3 inches.

APHELANDRA.

Nat. ord., Acanthaceæ.

A. Cristata.—A handsome shrub with brilliant orange-scarlet flowers, 2 to 3 inches long, in terminal branching spikes. Leaves broadly ovate pointed. Height 3 feet.

A. Facinator.—Leaves olive green, banded silver, white above, and purplish violet below. Flowers vermilion, in very large spikes.

A. Fulgens.—Bears larger flowers in the cold season than the last mentioned.

A. Tetragona.—A very handsome plant when in full bloom with its closely set vermilion flowers. Leaves lanceolate pointed.

A. Punctata.—Bright yellow.

A. Porteana.—Corolla and bracts bright orange.

A. Nitens.—Glowing vermilion scarlet, very large flowers, in erect spikes.

A. Leopoldi.—Citron yellow.

These may all be propagated by cuttings put down in the rains, without difficulty.

APLUDA ARISTATA.—*(Ornamental foliage pot plant.)*

Nat. ord., Graminaceæ.

A plant with foliage much resembling the bamboo. It grows to about two feet high, and is pretty planted in a pot of any ordinary soil manured with leaf-mould and well drained. Planted in the border it spreads quickly. Very hardy and grows anywhere, with no care, but is prettiest when well cultivated.

AQUATIC PLANTS.

To ornament artificial tanks and other pieces of water.

As Mr. Loudon reminds us, flowers for water are of two kinds, Aquatic and Sub-Aquatic: the former growing in the water, and the others at the edge of it. On the banks of running streams and in the water, most interesting plants may be found. Marshes, too, furnish vegetation in great and interesting variety, pleasing to study as well as very ornamental to the garden, should it possess an artificial or

natural pond, tank or stream. In the absence of any such ornament, a small tank, 20 feet square or less, might easily be constructed, and filled by having a tube attached to the water pipes in the house. After digging out the tank, plaster it all round with tempered clay (washed and kneaded) 10 inches or more in thickness, just as the natives plaster their mud houses. This will do for the banks: then put boulders of stone round where the water's edge is to be, and this will form a handsome basin, without much expense to those who have a garden in town with the advantage of water supplied to their houses. In and round this a variety of most beautiful Aquatic and Sub-Aquatic plants may be grown. Below is a list taken from Mr. Loudon's work on plants:

LIST OF AQUATIC PLANTS:

Flowering in May, in cold climates.

(Red)—*Equisetum fluviatile, Hydrocolite vulgaris.*
(White)—*Nasturtium Officinale, Ranunculus aquatilis.*
(Yellow)—*Ranunculus aquatilis.*
(Blue)—*Veronica Beecabunga.*

Flowering in June, in cold climates.

(Red)—*Equisetum palustre, Butomus umbellatus.*
(White)—*Hydrocharis morsusranæ, Phellandrium aquaticum.*
(Blue)—*Myriopyllum spicatum, M. Verticillatum, Pontederia cordata, Veronica anagalis.*
(Green)—*Potamogeton densum.*
(Brown)—*Potamogeton lucens.*

Flowering in July, in cold climates.

(Red)—*Heppuris vulgaris, Polygonum amphibium.*
(White)—*Alismedamas onium, A. Natans, A. Plantago.*
(White)—*Calla palustris, Nymphæa alba.*
(Yellow)—*Iris pseudo-acorus, Villarsia nymphæoides, Nuphar advena, N. Lutea.*

(Purple)—*Utricularia vulgaris, Trapa natans, Saggitaria sagittifolia.*

(Green)—*Ceratophyllum demersum, Cicuta virosa.*

FLOWERING IN AUGUST, IN COLD CLIMATES.

(Red)—*Hydropeltis purpurea, Polygonum hydropiper.*

(White)—*Cerastium aquaticum, Poa aquatica.*

(Yellow)—*Potamogeton natans.*

(Blue)—*Alisma ranunculoides, Lobelia dormanna.*

(Brown)—*Potamogeton perfoliatum, Scirpus fluitans, S. Lacustris, S. Triquetter.*

LIST OF MARSH PLANTS FOR THE EDGES OF WATER:

WITH SHOWY FLOWERS IN MAY AND JUNE.

(White)—*Pinquicula lusitanica, Oenanthe pencedanifolia, Oenanthe crocata, Oenanthe fistulosa.*

(Red)—*Pincuicula vulgaris.*

(Blue)—*Scrophularia aquatia.*

(Brown)—*Carex dioica, C. Caespitoso, C. Digitata, Schœnus nigricans, Carex paludosa, C. Riparia.*

(Yellow)—*Carez flava, Ranunculus flamula, R. Repens, Senecio peludosus.*

(Green)—*Carex disticha, C. Pulicaris, C. Precox, C. Stricta, C. Muratica, C. Elongata.*

LIST OF MARSH PLANTS FOR THE EDGES OF WATER

WHICH FLOWER IN JULY AND AUGUST.

(Red)—*Tenerium scordium, Memganthis trifoliata, Malva sepustris.*

(White)—*Littorella tacustris, Samolus naterandi, Schoenus albus, Galinur palustre, G. Uliginosum, Pedicularis palustris, Rumex obtusifolius, Diplacus pelosus, Serinum palustre.*

(Yellow)—*Hyperocum elodes, Hottonea palustris, Rumex maritimus, Acorus calamus, Myosotis palustris, Rumex palustris, Cineraria palustris, Senecio aquaticus, Sonchus palustris.*

(Blue)—*Schoenus mariseus, Phormium tenase.*

(Brown)—*Schoenus compressus, Scirpus acicularis, S. Eæspitosus, Pensus squarrosus, Schoenus nigricans, Scirpus palustris, S. Sylvaticus, Scirpus maritimus, Rumex crispus, Juncus sylvaticus, Scirpus noloschænus, Rumex aquaticus, Cyperus longus, Juncus acutus, J. Maritimus.*

(Variegated)—*Scutellaria minor, Angelica sylvestris.*

(Purple)—*Pedicularis sylvatica, Triglochin maritimum and palustre, Aster tripolium.*

All these may be grown from seed, and the list will be found an invaluable one, and is of itself a study.

AQUILEGIA VULGARIS.—*(Columbine.)*

Nat. ord., Ranunculaceæ.

A pretty plant (the Columbine of our English gardens). It is said not to flower in the vicinity of Calcutta, though it does very well in the more western parts of Bengal, and up-country, as well as in hill-stations, where it is commonly seen. Keep it a little shaded during the hot weather: it flowers well the second season. Its seeds may be sown in the plains in October, and in the hills in October and March and April. Any good garden soil suits it.

There are many improved varieties among the Hybrids. Cannell's hybrids are very fine.

Skinneri, golden tipped.

A Cærulia, large flowered, centre petals sulphur yellow, spurs and sepals pale blue, 2 feet high.

A. Californica Hybrida, yellow and orange-red, large flowered.

A. Glandulosa (Grigor's variety), large blooms. Tips of petals white, sepals dark blue. One of the best.

ARAUCARIA.—*(Tree Conifers.)*

Nat. ord., Coniferæ.

Trees of a most splendid genus, stately in their growth, and exceedingly handsome. Grown on a large lawn, they

are most ornamental, and many of them thrive in the plains, while all would grow in hill-stations. They are best procured by importation, as their seeds do not retain vitality long. To this class belong—

A. Cunninghamii.
A. Cookii.
A. Glauca.
A. R. Elegans.
A. Excelsa.
A. Imbricata, very handsome.
A. Bidwelli.
A. Rueli.

A. Mullerii is a newer introduction, of handsome habit, the pinnules gracefully pendant. It is a hardy variety.

ARDISIA.

Nat. ord., Myrsinaceæ.

Shrubs of an extensive genus, large and handsome.

A. Crenulata, flowers whitish, followed by rose-colored berries. Leaves oblong pointed, smooth and glossy. The berries are used for decoration in the same way as Solanums. *A. Paniculata*, distinct from either of the above. Flowers rose-colored, in terminal panicles of many compound branches. Leaves 6 to 8 inches in length, smooth, oblong. Berries red, smooth, the size of a pea. *A. Umbellata*, a large shrub like *A. Crenulata*, but with white flowers and berries black, the size of a pea. *A. Solanacea*, a large shrub with corymbs of rose pink flowers, followed by berries which are black, smooth and shining. *A. Macrocarpa*, flesh colored. *A. Oliveri*, rose pink. *A. Japonica*, white, a small plant. Propagated by seed and by cuttings in the rains.

ARENGA.

Nat. ord., Palmaceæ.

A. Saccharifera, a very handsome plant, the pith of which is used for sago, and the juice for making sugar.

Not uncommon in Indian gardens, with its fine dark green plume like leaves. *A. Obtusifolia* is a little different, and *A. Wightii* of later introduction and very pretty.

ARGYREIA.

Nat. ord., Convolvulaceæ.

A. Argenta, a very large climber with silvery velvety heart-shaped leaves, especially on the lower surface, which is almost like down. It bears whitish rose flowers in the rains. A native of Sylhet.

A. Cuneata, a small shrub 2 to 5 feet high; flowers deep bright purple, leaves smooth above, but crowded with hairs beneath, stem downy.

A. Splendens, an extensive climber. Flowers tubularly bell-shaped, 1½ inches long, hairy outside, of a pale red color. Leaves ovate oblong, covered with silvery down beneath.

A. Nervosa (Elephant's Ear Creeper): A huge climber, with flowers of a rose color. Too large for gardens. Leaves heart-shaped, very downy.

A. Speciosa and others are almost, if not all, Indian species.

ARECA.—*(Palms.)*

Nat. ord., Palmaceæ.

One of the prettiest varieties of Palms. Some consider the Cabbage Palm *(A. Oleracea)* the handsomest, while others differ, and consider the Betelnut Palm *(A. Catechu)* more graceful, and as they are not widespreading, they may be grown as ornaments in a garden without the fear of their throwing too much shade and destroying it. Grown from seed in any good soil.

ARISTOLOCHIA.

Nat. ord., Aristolochiaceæ.

There is a considerable number of varieties of this plant to be found now in India, of which perhaps *Elegans* is the

most common. The flowers are most curious in form. This variety has not the objectionable odour many of them have. It flowers when quite a small plant: its flowers are a very dark purplish velvety color mottled on cream or white ground, and being a neat climber is quite a nice addition in the garden. *A. Saccata* and *A. Indica* are natives of India. *Aristolochia ornithocephala* is a very curious member of this family. A rampant climber, with ashy grey green leaves and most peculiar bloom. An article in the "Indian Gardener" describes the flower in the following terms: "to render any description at all lucid, this species may be said to have the head of a hawk and the beak of a heron, with the wattles of a Spanish fowl, which however are grey, netted with brown, head of the same color, veined, and the beak grey." I have not been fortunate enough to see this flower. This plant is a native of Brazil. *A. Gigas* (variety *Sturtevantii*) is a gigantic variety and most curious. These plants are readily grown in a grass conservatory or plant house, in light soil enriched with leaf mould. Some of them, like *Elegans*, grow readily in the open in the plains, but in the hills will not succeed unless in a warm conservatory. *Elegans* may be grown from seed. The other varieties may be got from the Botanical Gardens, Calcutta, and are grown by cuttings put under glass or from seed *A. Labiosa*, flowers yellowish with purple and brown spots. *A. Braziliensis*, flowers yellowish. *A. Acuminata*, flowers greenish purple. *A. Crudata*, a small plant 3 feet high, bears flowers of a reddish brown color, with a long tail-like appendage. Suitable for pot culture.

ARNEBIA.

Nat. ord., Boraginaceæ.

A. Cornuta, a handsome annual introduced only a few years ago, forming a much branched bush, of about 2 feet in height and breadth, with lanceolate leaves. The blossoms appear all along the branches, bright yellow, blotched black,

changing to coffee brown later on. The seed should be sown in the plains in October, and in the hills in October, March, and April.

A. Echioides, flowers bright primrose yellow with a purplish spot between the lobes of the corolla, which disappear in a few days. (Perennial.)

A. Griffithii has narrower leaves than the above and the flowers are smaller and more yellow, and the calyx is differently shaped. (Annual.)

ARMERIA.

Nat. ord., Plumbaginaceæ.

These plants are not suited to the plains. They do well for edging borders and for rockeries or pot plants in hill-stations, and are propagated from seed or by division.

A. Vulgaris is a good plant for edging borders.

A. Cephalotes, deep rose, in large round heads on erect stalks.

A. Dianthoides, light pink.

A. Juncea, rose pink, and several others, all small plants.

ARTABOTRYS.

Nat. ord., Anonaceæ.

The name is derived from the word aratao, to suspend, alluding to the curious way the fruit is supported by the tendril.

A. Odoratissimus, flowers extremely fragrant, pale yellow. Leaves shining green, pointed. The flowers are borne chiefly in the rains, and are followed by yellow pear-shaped fruit. Propagated readily by seed and cuttings in the rains.

ARTEMISIA.—*(Flowering shrub.)*

Nat. ord., Compositæ. (Southern wood. Worm wood.)

A. Odoratissima, a small shrub with whitish leaves, of herbaceous habit, bearing small white flowers, which look

handsome in their great profusion on the plant during the cold season. Grow it in any good ordinary garden soil, but it is best grown in pots in the plain. It is propagated by division of the roots.

A. Alpina for the hills.

A. Argentea.

A. Cora.

A. Coerulius and

A. Dracunculum are other good varieties.

Dracunculum is Tarragon.

ARUM.—*(Pot plant. Rhizomatous roots. Foliage plant.)*

Nat. ord., Aroideæ.

Arum dracunculus is a native of the Cape of Good Hope, and is chiefly grown for the curious rather than pretty stem, which is spotted all over with white. It bears a chocolate colored flower, emitting a most offensive smell. *Arum Pictum* is a showy little plant, and requires a rich light soil, well drained. The leaves of this variety are arrow-headed, smooth, green round the edges and bright pink in the centre. They are easily cultivated. The plants die down in the cold season, but by watering they come up in March again. Propagated by division of the roots. *Arum Calla* or *Richardia Ethiopica* comes under the head Arum too, and is a most handsome plant with lovely flowers when well grown. *Ricardia Alba Maculata* is another variety of the same habit, but the leaves are marked with transparent blotches of white, which make it an object of great beauty even in the absence of its white flowers, which are, however, not equal to that of the preceding variety. It requires to be well watered and treated to liquid manure once a week to bring it to perfection. Water should be withheld when they have done flowering to allow the bulbs rest, and they should again be re-potted in October or November in the plains. *Arum Palestinum* or

Sanctum has purple black flowers that are both curious, pretty and sweet scented.

Newer than *Ricardia Ethiopica* of the old variety is *Ricardia Ethiopica Little Gem*, a profuse flowerer and a dwarf variety. *Ricardia Grandiflora* is another distinct new variety with very large flowers, 7 inches broad; and *Ricardia Elliottiana* is yet so new that its price is excessive. It bears pure yellow flowers. *Ricardia Luduychei* or the *Pride of Congo* is also very expensive yet. The flowers are yellow tinged in the centre with green, becoming more pronounced as the flower grows older. *Ricardia Hastata* is cheaper (three shillings); flowers clear yellow with a dark centre. These are the newest varieties of merit. All of them do well in a *very* rich soil, with lots of water supplied during the growing and flowering season. In the hills they flower most profusely in spring and again in autumn: after that they require little or no water in winter.

ARTHROSTEMMA.

Nat. ord., Melastomaceæ.

Very handsome shrubs. *A. Fragile*, flowers rosy, in terminal loose cymes of a few flowers. Leaves five nerved, ovate cordate and serrated. Branches hairy, 3 feet. *A. Nitida*, flowers lilac. *G. Versicolor*, white, changing to a reddish tint. Height 1 foot, shrub hairy. *A. Lineatum*, flowers white. A pot plant with elliptical leaves. Propagated by suckers.

ARUNDINARIA.

Nat. ord., Gramineæ.

These are frequently included under *Bambusa*. *A. Falcata*, leaves bamboo like, 3 to 6 feet high. Very useful for decorations. *A. Maximowiczii*, a Japanese species identical with *Bambusa Simonii*. *A. Metake*, leaves dark green, very sharp pointed, known as *Bambusa Japonica*. Propagated by division of the roots.

ARUNDO.—*(Ornamental grass. Gardener's garter.)*

Nat. ord., Gramineæ.

A. Versicolor, a pretty grass; green, striped with white, grows without care in any garden soil. Propagated by division of its roots, which soon spread rapidly and become troublesome.

A. Donax, height about 12 feet. *A. Conspicua*, height 3 to 8 feet, with silky white flowers, drooping in racemes, lasting for months. Grows very strong.

ASPARAGUS.

Nat. ord., Liliacæa.

There are several varieties of Asparagus that are most ornamental. Some of new introduction are both curious and beautiful, especially *Asparagus plumosus nanus*, which is of branching habit.

Asparagus tennissimus, though not entirely new, is a most graceful plant: its cladodes or false leaves are longer and lighter in color than *Plumosus*. As decorative plants, as well as for cutting for bouquets, they are of great value. *A. Acerosus* and *A. Racemosus* are older varieties than the two before-mentioned, nevertheless no one can for a moment dispute their value in the form of decorative plants.

They are easily propagated by division of the roots, and grow best in a light rich soil with good drainage, either as pot-plants or in the case of *Racemosus* and *Acerosus* in the garden, which however are quite eclipsed by the newer varieties. *Asparagus plumosus nanus* is a lovely feathery leaved plant and should be grown in pots. In transplanting great care should be taken in not injuring the fleshy roots. It succeeds well with me in the hills, and a large plant in a portico grows in a tub readily, seven or eight feet high. *Plumosus* may be grown from seed or from division of its roots. *A. Acerosus* is a native of Bengal, is a thorny climber,

the flowers of which are sweet scented, as also those of *A. Racemosus*. *A. Ascendens* is an erect shrub with delightfully silver like flowers, which are borne in November. *A. Plumosus* is much like *A. Plumosus nanus*, and in fact is a taller growing variety of the same.

ASPIDISTRA.

Nat. ord., Liliaceæ.

Foliage plants, the flowers being quite insignificant, produced close to the ground, with a mushroom like stigma which is curious. Grow in a soil manured richly with leaf-mould and give plenty of moisture. Propagated by suckers. *A. Elator*, handsome leaves, plant stemless, height 1½ to 2 feet. *A. E. Variegata*, leaves striped alternately white and green. *A. Mrida*, flowers purple, very handsome oblong lanceolate leaves on long petioles. Height 1 to 1½ feet. *A. Punctata*, leaves lanceolate on long stalk; allied to *A. Elatior*, but much inferior. It bears blue flowers under the surface of the soil.

These plants are best grown in a grass conservatory in the plains and in a glass-house or glazed verandah in the hills.

ASPIDIUM.

Nat, ord., Filices.—See Ferns.

ASTER.—*(French, German or China.)*

(Pot or bedding plant. Annual.)

Nat. ord., Compositæ.

The Aster is one of the most prized annuals we have in our stock, and it has been much improved of late. Many new varieties have sprung up, as it has been manipulated from time to time by the florist, who seems in modern times to have made it his study. Botanically it is known as *Callistephus*, a Greek word signifying beautiful crown. To say it is surpassingly beautiful is only doing it justice, and wonderful progress has been made in developing its beauty.

When grown in masses, it is most effective. The colors are of every shade, some tinted, some entire; petals quilled, semi-quilled, and flat, and their forms expanded or compact, flat or globular; petals tinted and curled like a Japanese Chrysanthemum, showing great diversity, both of color and form. They flower *profusely*, so much so that, in the dwarf varieties, their leaves are almost entirely hidden when they are in full bloom.

It is really a superb annual: quite a gem in its season: grown either as a pot plant, or for bedding. At first they were divided into sections called French and German. It would be hard now to say into how many sections they may be divided.

The German Asters are quilled, and surrounded by flat guard petals, like the Hollyhock. The Aster being so numerous in its variety, has been called by the fanciful the emblem of "Love of variety," and by others, from its brilliancy or resemblance to the heavenly luminaries, an emblem of "Immortality."

Cultivation of the Aster for the plains.—Sow the seeds in pots *early after the rains* in the plains and in October in the hills, and again in spring—April and May—if to flower in autumn (as soon as you can, the sooner the better), putting good drainage in the pots, half filling them with broken crocks, and over it a rich vegetable mould and one-third peat powdered, or the same quantity of sandy soil mixed with a little chopped up cocoanut fibre. Press this compost down on it, sow your seeds, and over them scatter a little more soil, evenly, and press it down again slightly. Care should be taken that the soil, for the surface especially, is well sifted. When the plants are one inch high, transplant them *carefully* into beds, or into pots again, of richer compost than that first used; and I think transplanting them even a second time would benefit them. Care should be taken in watering them, that they be watered from the side

of the pot, for if they are watered by a *mali* overhead, the fall of water often crushes their foliage and branches into the soil, injuring them exceedingly, so much so that their bloom is never so good as that of those which have escaped being damaged. *Cultivation of the Aster in hill-stations.*—In hill-stations, they must be cultivated in the same way, and the seeds sown at the same time other annual seeds are sown—in spring. To obtain special varieties separately, they can be obtained from England or from special seedsmen. If sown in autumn and protected in winter, they will flower beautifully in spring.

A. Ray, or *Ray aster*, 20 inches high, white, a novelty, Cannell & Co.'s.

A. Giant comet, white, Cannell & Co.'s.

A. Comet, improved Giant, white.

A. Comet, light blue and indigo, peach blossom, white, rosy pink, lilac, purple, crimson, etc.

A. Ideal, a new class of bouquet, pyramidal growth: flowers medium size.

A. Jewel R. Ball, white. *A. Mignon*, lilac.

A. Eynsford yellow.

A. Cannell's Victoria, very fine.

A. Dwarf Bouquet.

A. Chrysanthemum flowered.

A. Emperor or *Giant.*

A. English quilled or globe.

A. Humbolt.

A. Imbricated pompon.

A. Lady in White.

A. Triumph, deep scarlet.

A. Paeony flowered perfection. Japanese tassel Aster. Betteridge's quilled Aster.

A. Semples, late flowering, branching.

A. Pompon crown, centre white, surrounded by some other color.

There are at the present day many varieties with very much improved flowers, with petals arranged in many forms, some of them not unlike Chrysanthemums.

ASTRAPÆA.

Nat. ord., Sterculiaceæ.

A. Wallichii, a large tree, but will flower when only a few feet high. Its flowers are scarlet, borne in drooping umbels. Leaves large, angularly lobed. An exceedingly handsome plant.

A. Tiliæflora, flowers pink.

A. Viscosa, flowers pink. Firminger's description of the color of the flowers of *A. Wallichii* would imply he described one of the two latter species mentioned. Propagated by cuttings of young wood or by layers. Grow plants in shade.

ASTROCARYUM.

Nat ord., Palmaceæ.

Very ornamental palms.

A. Argenteum, leaves arching and covered with a white scurf, giving the plant a silvery appearance.

A. Filare, slender plant. Leaves covered with a white scurf. These are grown in the grass conservatory, being exotic.

ASYSTASIA.

Nat. ord., Acanthaceæ.

These are nice herbaceous plants with flowers in axillary racemes or terminal clusters, funnel shaped and five lobed. Branches slender.

A. Chelonioides, flowers reddish purple, bordered white, in terminal racemes.

A. Coromandeliana, rather weedy. Flowers lilac.

A. Scandens, a climbing plant with cream colored flowers.

A. Macrophylla, flowers bell-shaped, rosy purple outside, almost white inside.

A. Violacea, flowers violet purple striped white, borne in terminal racemes. Raised from seed sown in October in either the hills or plains.

AUCUBA.

Nat. ord., Cornaceæ.

A. Japonica. The leaves of this plant are very handsomely mottled with yellow, the midrib being prominent and the rest of the leaf being veined. The leaves are leathery, shining pale green, broad, ovate, lanceolate pointed, and toothed along the edge. There are several varieties with various variegations of great beauty. These plants must be grown in the grass conservatory in the plains. In the hills they succeed very well, especially if sheltered during the monsoons. Propagated by cuttings and layerings.

ARALIA.

Nat. ord., Araliaceæ.

This genus of plants thrive well in our gardens, and are both trees as well as shrubs, the latter comprising some very ornamental plants with a great diversity of foliage, very handsome in character.

They grow very well in almost any well-drained soil, and in any position, but are the better for shade. Some of the varieties are difficult to propagate; these require to be budded; or treated, as is recommended by the "Indian Gardener," as follows (after his mentioning that *A. Guilfuylei* takes readily by cuttings): "Select cuttings of *A. Guilfuylei* as nearly as possible of the same size as the plant to be

grafted, which should be cut into pieces about 3 inches in length: make a sloping cut at the lower end of both stock and scion, about one-and-a-half inches long and about half way through the wood, so that when they are put together they may meet exactly on both sides; then tie firmly together and place in sand, taking care that the joining is below the surface. As soon as the stock or *Guilfuylei* is properly rooted, it may be potted off. When the grafted plant begins to grow freely, stock should be cut back level with the soil."

A. Chinensis, handsome: leaves woolly when young on both surfaces: pinnæ seven, ovate, serrated at the apex, erect and distinct.

A. Charbicrii, a very handsome plant, with graceful spreading pinnate foliage: it is of medium growth; leaves in well developed specimens, a foot long, of a deep green with crimson midrib; leaflets opposite 6 to 9 inches long. A free-growing plant; very elegant in appearance.

A. Chabueri, also a handsome plant of dwarf growth and with foliage much divided; pinnæ regularly blotched and marbled with white and grey.

A. Elegantissima, foliage deep green, shaded brown, midrib white, stem erect, leaves digitate on long green foot stalks which are mottled white, filiform leaflets pendulous.

A. Filicifolia, well clad with foliage, stems and leaf stalks deep purple; pinnæ bright green with purplish costa opposite and deeply pinnatified.

A. Guilfuylei, one of the commonest in Calcutta, has beautiful foliage, and is one of the hardiest and best, with bold pinnæ and variegated leaves, having longish terete petioles furnished with 3 to 7 oblong elliptic leaflets irregularly margined with white, and the surface occasionally blotched grey.

A. Veitchii, one of the handsomest introduced, leaves digitate : leaflets narrow, dark green above and red below.

A. Reginæ, as the name implies, the Queen of Aralias ; larger than Veitchii, with leaves more closely set, and habit extremely graceful. The stems and petioles beautifully freckled. The palmate divisions of the stock smooth and uniform green.

A. Reticulata, leaves strap shaped when young and becoming larger with age, dark green ; reticulated of a lighter shade of color. Very handsome.

Others quite as handsome, as some of those mentioned, are :—

A. Kerchoveana, A. Longipipes, A. Monitrosu, A. Guercifolia, A. Rotunda, A. Schomburkii, A. Spinulosa, A. Ternata, A. Veitchii, A. Gracillima, A. Cochleata, A. Maculate, A. Nobilis, A. Laciniata, A. Leptophylla, and several others.

ASYSTASIA.

Nat. ord., Acanthaceæ.

Asystasias are mostly all pretty flowering plants. *A. Formosa* is decidedly so, with its scarlet tube-like flowers which are borne at almost all seasons. It is an herbaceous plant with rather a delicate constitution, and is best grown in a pot under partial shade. This with all the other varieties may be reared from seed sown in the plains in October and in the hills in March or April. *A. Africana*, flowers white. *A. Coromandeliana*, light purple flowers, with pale yellow tube.

AURICULAS.—*(Pot-plants, for hill-stations.)*

Nat. ord., Primulaceæ.

Flowers of great beauty ; a true Florist's plant, owing all its beauty to cultivation. It is a native of Switzerland, where it grows wild, and has pale yellow flowers, which are sweet-scented.

When cultivated, the colors are extremely brilliant and rich. It delights in shade, cannot bear damp,—*this must be borne in mind.* I am afraid there is very little hope of the Auricula ever being grown in the plains of India, however much care may be taken of it. Our remarks apply only to its cultivation in hill-stations. The seeds may be sown in October or March, in pans, and when the plants are strong enough, they should be transplanted singly in small pots, or in twos or threes in larger ones. The best way is to plant them singly. Place the drainage so as to fill one-third of the pot, then add the earth so as to form a cone, on this spread the roots, press down the compost and add a little more over it, leaving the collar of the plant just higher than the edge of the pot. The compost should be made from turf two-thirds, and very old cow-dung, almost turned to mould, one-third. This is recommended by Mr. Glenny as a compost for Auriculas, and he says, if this is found adhesive, as it should be, a little sand may be added. There are the Alpine and Show varieties to select from, the former being the most hardy. Both varieties are very beautiful.

AZALEA.—*(Border and pot-plants for hill-stations.)*

Nat. ord., Ericaceæ.

These are all natives of America, China and Turkey. They vary in height from 2 to 15 feet. The finest for conservatory decoration are the Chinese and Indian varieties, and they require the same growing season as Camellias, and until they are bushy enough, may be grown on throughout the year, being stopped four or five times by pinching off the shoots. Growth may be induced by the use of forcing pits, and their blooms enjoyed from six to eight months during the year. Their treatment in this country corresponds with that of the Camellia so closely that I refer the reader to the remarks on that plant. Their varieties are very numerous indeed. The compost used for them should be peat two parts

(or what is made to resemble it), loam two parts, a very little sand and one-sixth part charcoal dust, steeped in manure water. *A. Balsaminaeflora* is a double flowered variety, choice and distinct. There are a large variety to select from.

BABIANA.—*(Bulbous pot-plant.)*

Nat. ord., Iridaceæ.

Dwarf bulbous plants, of a numerous genus, natives of the Cape of Good Hope, bearing flowers of great beauty; but not suited to the plains of India, though they do well in hill localities, as Simla, Mussoorie or Darjeeling. They enjoy a sandy soil, mixed with peat, or any compost to imitate it. Of easy cultivation, and in climates that suit it, a free flowerer. Like all bulbous plants, it requires the pot it is grown in to be *well* drained. Plant in spring in pots, and then, if desired, in the open bed, or keep in pots. *B. Ringens*, bluish purple scarlet, very handsome. *B. Stricta*, lilac blue. *B. S. Augustifolia*, blue and rich crimson. *B. Plicata*, clove scented, violet blue, anthers blue. *B. Disticha*, hyacinth scented, perianth pale blue.

Babiana villosa, delicate violet. Height one foot.

Babiana mixed, various colors. Height one foot.

These are the best varieties named above. All are 6 inches to a foot in height.

BANKSIA.

Nat. ord., Proteaceæ.

These have not succeeded in India in the *plains;* and I do not know if they have been tried in the hills, where they would more likely succeed. The best are *B. Acmula*, *B. Collina*, *B. Dryandoides*, *B. Occidentalis*, *B. Speciosa*.

BALSAM.—*(Balsam, Annual, Half-hardy.)*

Nat. ord., Balsaminaceæ.

This is a very choice annual for either conservatory or out-door decoration. No assortment of annuals is complete

without it. There are some magnificent new varieties which are a great improvement on the old sorts, and are quite an acquisition: I mention them below, and trust that some of the readers of this work will be induced to get them as being really unsurpassable for their beauty. They require a rich compost; and frequent transplanting benefits them. Plants from imported seeds bear more flowers and less leaf than acclimatized seed. They should be sown in boxes or large pots; or in the open border for succession, if there is not any likelihood of very heavy rain in August, September, and October. Those sown in August and September will be the finest, unless artificial heat is afterwards used. They should not be sown too thickly, and, when strong enough, should be transplanted, and planted up to the lower leaves in mould each time of transplanting; that at least not less than twice or three times. After each transplanting, they should be shaded for three or four days from the sun by matting, so as not to be injured, and the greatest trouble and care taken will be repaid by most handsome flowers if a really good strain of seed is procured. They may be grown as standards by pinching off all side branches and training them to grow on a single stem. They must have plenty of air and light, also lots of water, and frequent watering with liquid manure as well.

By the above mentioned the greatest success will be attained; and if the florist or amateur raises his plants thus—from seed obtained from plants grown in this country from imported seed—he will find there is not so much leaf as is seen ordinarily on plants grown from carelessly selected seed, more and larger flowers will be the result. The plants are often so crowded with flowers as to appear miniature pillars of color. Care must be taken to keep plants with flowers of different colors at a good distance from each other, or the seed from these will be hybridized, the colors of uncertain and dimmer hue, and the results, at the best, partially satisfactory. The best and most perfect flowers must be chosen to select seed from.

The Camellia flowered are very large and beautiful double-flowered varieties, of many colors, some of which are beautifully spotted, others striped and self-colored.

They cannot be transplanted too frequently if large flowers, or a reduction of leaf with an increased number of flowers are wanted. Shelly says they may be transplanted even ten or eleven times. I have not tried it so often, yet I cannot think it prejudicial. The plants should be carefully watched as the seed vessels burst and throw out their seed. Some of the double varieties yield seed very sparingly, the greater necessity therefore for vigilance in securing those that have borne seed, examining the plants every second day for this purpose.

BAMBU.

Nat. ord., Graminaceæ.

In a large garden some of these may be used as a shelter from strong winds. Many of the dwarf varieties are very ornamental, such as *B. Fortunei*, height 1 foot to 2 feet. *Variegata argenteo Vittata* are varieties of the above. *B. Nana* is 6 to 10 feet high.

BANISTERIA.—*(Creeper.)*

Nat. ord., Malpighiaceæ.

We have chiefly two varieties of *Banisteria* in this country. *Banisteria laurifolia* is well known to most of us, with its olive-green foliage of lanceolate leaves, roughish and hard to the touch. When covered over with its bright yellow or golden flowers in large clusters, it is exceedingly pretty. *B. Argentea* is less known. It has larger leaves, which are of a silvery hue on the lower surface. A very ornamental and desirable variety. Both varieties are extensive creepers, and require to be well supported by strong posts. Propagated by layering.

B. Chrysophylla bears deep orange colored flowers which are axillary and corymbose. The leaves are ovate-oblong and acute and covered with shining golden down.

B. Ciliata bears large orange colored flowers in umbells. The leaves are cordate orbicular and smooth fringed, with hairs.

B. Ferruginea, yellow flowered. Leaves pointed and shining rusty color below.

B. Flulgens, yellow flowered, in umbellate corymbs. Leaves ovate, smooth and pointed, silky beneath.

B. Humboltiana, yellow flowered. Leaves roundish and ovate.

B. Seresia, yellow.

B. Splendens, yellow flowered, borne in axillary racemes, which are dichotomous, umbellate. Its leaves are cordate, kidney shaped, and silky below.

BARLERIA.—*(A shrub.)*

Nat. ord., Acanthaceæ.

An extensive genus of shrubs, the handsomest of which is *B. Gibsoni*, which has large flowers of a light blue color, and flowers throughout the cold season. A shrub about three feet high with pointed lanceolate leaves. Barleria grows in any ordinary garden soil, and is a hardy plant. Other varieties have flowers of different colors—white, rose-colored, and blue; none of them are so handsome as *Gibsoni*, in my opinion.

B. Buxafolia, no ornament, flowers white.

B. Ciliata, pale blue flowers.

B. Dichotoma, flowers white.

B. Flava,* flowers yellow.

B. Leichtensteiniana,* flowers very curious, packed in overlapping bracts.

B. Lupulina, light yellow.

B. Longifolia, white.

B. Mackenii,* large purple.
B. Rosea, rose.
B. Prionitis, yellow.
B. Caerulia, blue.
B. Montana, rose, leaves purplish.
B. Hirsuta, blue.

BARNADESIA.

Nat. ord., Compositæ.

A pretty and curious plant, easily grown in a light soil from seed or from cuttings. Sow seed in March in the hills, October in the plains. *B. Rosea*, rose colored flowers. This plant requires a dry atmosphere.

BARRINGTONIA.

Nat. ord., Myrtaceæ.

These are trees of considerable size and mostly unsuited to private gardens, though they are some of them particularly handsome, especially *B. Racemosa*, a good sized tree, which is of great beauty, but to view it in its beauty one has to see it in the early morning before its flowers begin to fall, as it is a night bloomer. The flowers are in long pendulous racemes on short stalks; calyx three parted, purplish, petals greenish white and with many stamens, one and a half inches long, bright pink. This tree loves a damp situation, and is best planted near a tank. Leaves 12 to 15 inches long by 5 to 6 inches broad lanceolate.

B. Acutangula is another handsome tree, little if at all inferior to the last mentioned, and is known by some people as the "Indian Oak." Its flowers are in racemes 18 inches long, of a rose pink colour, with numerous long stamens. This tree too loves a damp situation Its leaves are 6 inches long by 2 inches broad, with toothed edges.

B. Speciosa flowers in pendulous racemes 18 inches long, with deep rose or red flowers, with many stamens. The above are propagated by seed.

BARTONIA AUREA.—*(Golden Bartonia, Annual.)*

Nat. ord., Loasaceæ.

A showy little annual with brilliant yellow flowers which open only when exposed to the full rays of sunlight. This plant should have a rich soil and plenty of water, but care should be taken that it does not lodge about the collar of the plant, as it is liable to rot. I would recommend its being watered from the bottom of the pot it is grown in, by placing the pot in a saucer of water, till it is transplanted into beds, and then it should be watered frequently, but only have small quantities of water each time. Sow the seeds in pots at the same time and in the same way as other annuals are sown.

BATATUS.

Nat. ord., Convolvulaceæ.

B. Paniculata is a tuberous-rooted plant bearing large purple flowers in September. It is an extensive climber, with palmate leaves. Propagated by division.

BAUHINIA.

Nat. ord., Leguminosæ.

(Vernacular Cachnar.)

Mostly small trees of an ornamental character and generally slow growing. *B. Acuminata*, flowers white. *B. Aurita*, flowers white. *B. Corymbosa*, flowers in loose racemes, pink and crenulated at the edge; a shrubby climber. *B. Inermis*, white linear petals. *B. Multinerva*, snow white linear petals, native of India. *B. Purpurea*, red, one of the petals streaked with white on the claw, native of India *(Kuchnar* of the natives). *B. Racemosa*, white, native of India. *B. Tomentosa*, petal pale yellow with a red spot, native of Ceylon. *B. Variegata*, red marked with white and yellow, native of Malabar.

B. V. Chinensis, petals lilac with one purple spot at the base of each petal. *B. Ferruginea*, an extensive climber with a rusty colored appearance all over the plant, especially under the leaves. Flowers in large racemes, greenish white at first, turning yellow with age. Propagated by seed or by layering.

B. Natalensis, flowers white, 1½ inches across. The leaves are small.

BEAUCARNIA.

Nat. ord., Liliaceæ.

Very graceful plants, with leaves narrow and drooping. The stems are slender and with a curious swelling at the base. They require a light soil and good drainage, with a plentiful supply of water in their growing season. Propagated by seed or by cuttings.

B. Glauca, 2 to 3 feet high.

B. Latifolia, a stout and robust grower.

B. Longifolia, leaves 6 to 10 feet long, plant 10 feet high.

B. Recurva, leaves very long, linear and graceful.

B. Rubra and *B. Stricta*. They grow in the plains readily, but in the hills require protection.

BEAUMONTIA.—*(Creeper.)*

Nat. ord., Apocynaceæ.

Beaumontia Grandiflora is a very extensive and rampant creeper, bearing a profusion of flowers of a trumpet form, white tinged with green, which are very pretty, and slightly scented. The leaves are oblong-ovate, smooth and shining above, but downy beneath, tapering to the base, and about nine inches long.

This is a rampant climber and requires a strong support or tree to climb on. Propagated by layering.

BEGONIA.—*(Elephant's ear.)*

Nat. ord., Bigoniaceæ.

A very extensive genus of plants, that has become very popular in public estimation, and has been vastly improved of late years, so much so indeed as to rival the gems of the garden, Geraniums and Calceolarias, as bedding plants, and again as foliage plants they are simply unique, beautiful and curious. They are as a rule compact dwarf plants, and are thus useful for pot culture and decoration. They have been divided into four sections,—1st, the Tuberous-rooted or Flowering section; 2nd, Rex or Herbaceous section, the parent of which is *B. Rex*, a native of this country; 3rd, the Shrubby section; a new division has been added called the Dis-color Rex section. The cultivation of this plant was not thoroughly understood in former years, and consequently repeated disappointments resulted therefrom. The soil most suitable to them is—

Loam ...	...	2 parts.	
Cow-manure, old	...	2 „	This must be very old, or in place of that leaf mould.
Coarse grit or sand	...	2 „	
Cocoanut fibre refuse	...	1 part.	
Brick, broken very small		1 „	

and charcoal coarsely powdered, a small quantity.

The pots must be well drained, so after having laid a good layer of crocks, place some pieces of charcoal above it, and this will complete all that is required in that direction

Rex Section.

They are easily propagated in silver sand from a well matured leaf as follows: Having a shallow pan with good drainage and over that silver sand with some powdered charcoal mixed with it; take off a well matured leaf with about three inches of its leaf stalk; insert the leaf stalk in the pan, then peg down the leaf so as to have its lower surface in

contact at every point with the sand, and proceed with a knife to divide every one of the central veins of the leaf.

At these incisions young roots will form, and plants spring up.

Or yet another method of leaf culture may be adopted by cutting up a leaf into pieces, each piece having at least one central vein: take these and plant them erect in the pots. When large plants are available, each shoot may be cut away with a portion of roots on each; but should any shoot not have a root, it is best to put it into a pan separately, and keep it close for a few days, when it will then readily strike.

Begonias require a shaded position: by this I mean they will not stand the direct rays of the sun during the day time, say from 9 A.M. to 5 P.M. in the plains. An orchid or grass-house is best suited for them, and the pots should either be sunk in the soil, or they should be grown in ring pots, the interspace being filled with moss or cocoanut coir. In the event of the pots being sunk in the ground, a small vacant space should be left under it to ensure good drainage. A moist atmosphere seems to suit them best.

There is such an immense variety of this plant, that to give a detailed list would be beyond the limit of this work, besides being needless. Appended is a list of some good varieties, of which there are a great number.

B. Argentea Hirsuta. Leaves white, edged green and crimson, and the latter portion of the leaf is covered with small hairs. Leaves 9 inches long. A robust variety.

B. Otto Forester. Leaves bronzy green with white, veining and marbling. Foliage of large size.

B. Iona. Leaves olive green with blotches of silver between the veins, edged with bronzy green. A highly ornamental variety.

B. Lebrum. Leaves bright green, edged with almost black, and with white spots over the whole surface of nearly

a quarter of an inch in diameter. Leaves about nine inches long. A bold handsome variety.

B. Gorgoensis. With large round leaves, bright green, veined with rosy carmine and covered with a velvety down of metallic lustre.

B. Albia.—Very newly introduced, with leaves dark green, covered with reddish hairs, mottled white.

B. Mrs. Larmour.—A hybrid raised by Mr. Charles Maries, F.L.S., formerly of the Raj Darbhanga. Plant compact and dwarf in habit, with leaves in great number, of a brilliant hue. This is a new acquisition.

B. Starlight.—Leaf centre bronzy green surrounded with white, which again is margined with light green. The margin spotted with silver edged with bronze.

B. Rosalie.—White centre with metallic reflection, small bronzy centre and dark green margin. Leaves and stems covered with hair of a red color.

The Shrubby Section has nearly disappeared from our gardens. The Discolor Rex Section, when well grown, attain a height of 1½ to 2 feet. Their foliage is much smaller and not so well marked as that of the Rex Section. As yet they are not very well known in this country generally. The following varieties have been introduced, and perhaps a few others :—

1.—*Aligateur.*
2.—*Barone Leroy.*
3.—*Countess de Clermont Fonnere.*
4.—*A Carriere.*
5.—*Edouard Andre.*
6.—*Ed. Pynœrt.*
7.—*Kissing Sohn.*
8.—*Le Florifere. Lucienne Bruant.*
9.—*Madame Grahn.*

10.—*Marguerite Bruant.*
11.—*Madame I. Menorcau.*
12.—*M. M. Nicholson.*
13.—*Nivosa.*
14.—*Palais Rameau.*
15.—*Perle Poitevine.*
16.—*President de la Devansaye.*
17.—*Professor Poirault.*
18.—*Sov. Dr. Weddell.*
19.—*W. E. Gambleton*, and many others.

The Flowering or Tuberous-rooted Section of Begonias.

These flower well in the hill-stations of India; though few attempts have been made to cultivate them in the plains. Very many good varieties may be seen growing in Darjeeling, protected from the rain, under the shelter of a verandah, without the least difficulty. The pots must be well drained with pieces of charcoal, after which they should be filled with a light compost of—

Loam	...	...	... 3 parts.
Leaf-mould	...	...	... 3 ,,
Sand	...	...	... 1 part.
Moss, or cocoanut fibre chopped fine			... 1 ,,

They flower in Darjeeling, Simla and Mussoorie in June, July and August.

The tubers should be received in the plains in September, and planted as soon as received, after which they should be started under glass. In hill-stations the best time to obtain them is just at the close of the cold season, the pots being plunged in a hot bed. I have grown both single and double varieties most successfully in both Darjeeling and Mussoorie. Should mildew appear on the plants, I have found putting the potted plants out in the rain the readiest remedy, or dust with sulphur. The tubers are much like a potato, but hairy, with small roots. Out of these in spring will start small red buds. Then they should be planted

in the soil or compost above mentioned, with the bud just out of the soil. Water lightly at first. A peaty soil is the best for them if you can get it. Keep in shade, in full light. Avoid dust and cold draughts, and water with liquid manure when in flower.

They are easily raised from seed: the bulbs, however, will not flower till the second year. The seed is very fine, and, when sown on the surface of a good sandy compost enriched with leaf-mould, must be covered with a pane of glass, and kept in a dark room till the seed germinates. The small plants must be pricked out when quite small and planted two or three inches apart in a large pot. As they grow each plant should be potted off after this into single pots.

They must not be exposed to heat, sun or cold, and delight in a temperate atmosphere of about 60° or 70°. It would be futile to try and grow them in the plains from seed. In the hills sow the seed in April.

Cannell & Co. have a splendid strain of Begonias, both single and double. The colors are most beautiful, dazzling and delicate, of immense size, as well as of most perfect form. It would, indeed, be difficult to find anything more charming than these lovely waxy huge blooms. They require to be well cared for, as they deteriorate year by year, more or less. The bedding varieties are smaller flowered but hardier, and I would recommend, if you try them on the plains, to use these grown in pots. In the hills the large flowering and double varieties succeed well. There are some perpetual flowering varieties, such as *Begonia Weltoniensis.*

Begonia Odorata Pioneer is sweetly scented. *Begonia Tuberosa Vittata* has striped flowers. *Begonia Odorata Saladin* is another sweet scented variety. I may add here, from my own experience, I prefer to grow tuberous large flowering Begonias in a compost mixed with leaf-mould, avoiding cow manure or horse litter, however old. The plants are less liable to be attacked by mildew.

BELLIS PERENNIS.—*(Daisy.)*

Nat. ord., Compositæ.

The Daisy is grown in the plains as an annual, though I have kept it for more than a year in such localities under shade in the hot months of the year. Sow the seeds at the same time with other annuals: in the plains in October, in hill-stations in October, March, April, or May. It will be found best to sow the seeds in pots or boxes. Among Daisies there are many varieties well worthy of cultivation. The large double Daisy, the large quilled Daisy, the hen-and-chicken Daisy are all good varieties, and, if *sown in rich soil, give fine flowers*, which in hill-stations would do admirably for edgings of borders or beds. They have been improved very much. *Bellis maxima fl. pl.* is fully 1½ to 2 inches in diameter.

Frequent transplanting and division does them good. Varieties with variegated foliage are *Acubaefolia*, crimson flowers, and *Acubaefolia*, white flowered. In the hills, if kept in shelter, they flower all the year round, and are most acceptable in winter.

BELOPERONE.

Nat. ord., Acanthaceæ.

These are very pretty plants, which are easily cultivated. Propagated by cuttings taken during the rains. *B. Oblongata*, with purplish crimson flowers at almost all seasons, borne in spikes; leaves oblong-lanceolate; height 3 feet. *B. Violacea* bears violet colored flowers, and *B. Nervosa* is a much larger plant bearing pink flowers. These are all propagated by cuttings put down during the rains.

BERBERIS.

Nat. ord., Berberidaceæ.

These I hardly think worthy of cultivating in our gardens of the species introduced, and those that might be imported would not suit the gardens in the plains. *B. Aqui-*

folium, *B. Buxifolia*, *B. Canadensis*, *B. Darwinii*—this is a handsome plant, and is worthy of a trial in the hills and plains. Its flowers are orange colored and borne in racemes—*B. Emarginata*, *B. Floribunda*, *B. Japonica*, *B. Wallichiana* are the best species. *B. Nepalensis* is to be seen growing wild in the Himalayas. Propagated by cuttings as well as by seed.

BERTOLONIA.

Nat. ord., *Melastomaceæ*.

These are grown in grass conservatories in the plains, and are most elegant creeping plants with most beautifully velvety or variegated foliage. Propagated by seed or cuttings. They require a light rich soil, well drained. In the hills they require a warm house. *B. Maculata*, *B. Marmorata** *B. Pubescens*, *B. Marchandii*, *B. Marchandii Superba*.* Propagated by cuttings put in sand under a bell-glass, chiefly in the rains These plants enjoy a close, warm, humid atmosphere.

BESCHORNERIA.

Nat. ord., *Amaryllidaceæ*.

These should be cultivated just like Agaves and Aloes, to which they bear a resemblance. *B. Bracteata* bears yellowish flowers, which are at first green. Height of plant 5 to 6 feet.

B. Decorteriana, flowers green, tinted red.

B. Tonelii is the handsomest of these plants. Its flowers are tubular and blood red and green, which are borne in a panicle 2 feet long. The scape is 4 feet high and reddish purple. Propagated by division. They are natives of Mexico.

BIGNONIA.—*(Creeper.)*

Nat. ord., *Bignoniaceæ*.

The Bignonia is a large genus of both trees and creepers. I will only mention those which are most worthy of a place in the garden. Some of them are very handsome, and all grow well in any ordinary garden soil.

B. Chamberlaynei.—Of extensive growth, leaves pinnate, in pairs, of a rich glossy green. Each leaf is oval. Flowers primrose colored, borne from the axils of the leaves in great profusion all the year round.

B. Gracilis—Has yellow flowers, which are two inches long and three inches across, compared by Firminger to the flowers of an Allamanda, which they much resemble. A very pretty object when in flower.

B. Incarnata.—Bears lilac-colored flowers, striped with purple during the hot season; very handsome.

B. Venusta syn. Cherere.—The most beautiful of all Bignonias, and a very extensive climber. Leaves, in pairs, pinnate. When in flower literally one mass of gorgeous color; nothing can be more beautiful in the form of a creeping plant in my opinion, with which many of my readers will concur. Flowers vermilion-colored, in corymbs, which are drooping, and each flower tubular, about two inches long.

B. Magnifica.—A new introduction. A climbing plant and quite an acquisition. Flowers freely in pinnacles; each flower being of a large size and of attractive color, ranging from delicate mauve to rich purplish crimson, with a conspicuous throat of primrose color.

B. Crucigeria.—A climbing shrub, not attractive, bears dull yellow flowers.

B. Grandiflora and *B. Radicans.*—Much like each other, with dull red flowers.

B. Variabilis.—Bears flowers which are tubular, greenish yellow, ultimately white, in racemes of many flowers.

B. Picata, B. Rozleana or *Rozlii, B. Excelsa, B. Ornata* and *B. Violacea* are of late introduction, the latter with handsome violet colored flowers.

Bignonias are propagated by layering or by cuttings put under glass.

BILLBERGIA.—*(Pot-plant.)*

Nat. ord., Bromeliaceæ.

Plants with leaves much like pineapples. Require treatment similar to that for aloes. These are good plants for shaded situations and plant houses (grass houses). They do best in heat, though when once growing stand a cooler atmosphere. Propagated from suckers in a shaded situation in boxes or pots.

B. Baraquiniana, green flowers, bright scarlet bracts. *B. Irifolia*, flowers red and yellow, tipped blue. *B. Liboniana*, coral red, and white and purple: a splendid variety. *B. Leetzei*, bracts pink, sepal pinkish rose, corolla greenish. *B. Marmorata*, flowers deep blue, calyces green, tipped blue, bracts bright scarlet: very pretty. *B. Moreli*, sepals red, very woolly: purple violet petals, bracts rosy red. *B. Sandersii*, sepals crimson, petals yellow outside and blue within, leaves green above, purple beneath, and spotted white and tufted.

BIXA ORELLANA.—*(Anotto tree.)*

Nat. ord., Bixaceæ.

A small tree about 10 feet high, bearing seeds from which the dye called anotto is got. The foliage of the tree is dense: leaves heart-shaped, and it bears flowers like the peach, in pinnacles. Propagated by seed. It grows in any ordinary soil, and requires no special care.

BLANDFORDIA.—*(Bulbous plant.)*

Nat. ord., Liliaceæ.

I am not aware if these have been grown in this country, but I think some of our more experienced gardeners might try them successfully in the plains. They are very beautiful, and are natives of Australia. *B. Aurea*, *B. Flammea*, *B. Elegans*, *B. Grandiflora*, *B. Flammea princeps*, *B. Nobilis* are the best, and all of these are very handsome. They should be grown in a soil made to resemble peat and loam in equal parts,

and sand, of which there should be a sprinkling. They should be repotted in autumn moderately firm and with good drainage. Water must only be given when dry till they begin to grow. Then they may be watered more freely and be exposed to more heat, when they will flower. After the bloom is over and the foliage ripened, they may be stored away in their pots till the time comes for repotting. They are propagated by division.

BLETIA.

Nat. ord., Orchidaceæ.

Leaves narrow grass-like orchids. These flowers freely planted in leaf-mould and loam covered with a layer of moss, and are propagated by division of the roots after flowering. Water well while growing.

B. Florida, flowers pale rose, lip spurred. *B. Hyacinthina*, purple racemose, and lip not spurred: flower on branching spikes. *B. Shepherdii*, branching spikes of flowers, purple, and yellow down centre of lip. *B. Sherrattiana*, about a dozen flowers on a spike: rich rosy purple, lip deep purple, front marked white, and yellow down the centre.

BLUMENBACHIA.

Nat. ord., Loasaæ.

These are annuals with curious and really interesting flowers. They, however, have the habit of the Nettle and sting. *B. Coronaria*, flowers yellow, with most curious boat-shaped petals, five or more in number. Other species are *B. Chuquitensis*, a climber, with flowers red outside, yellow within. *B. Contorta*, flowers orange red. Sow seed of this in October in the plains and March in the hills.

BOMAREA.

Nat. ord., Amaryllidaceæ.

These have been, I know, tried with little or no success in India, on one or two occasions, but I do not think they

have had a fair trial, especially in the hills, where I do not think they have ever been grown. They are lovely flowering climbers, and are best grown in a sheltered border. They may be grown however as pot plants. They may be grown from seed in a moderate temperature. They may also be grown by division of the roots, each portion having some roots.

I think this plant can be grown in India successfully, as it is moderately hardy, and can be grown as such in the south of England.

Its seed can easily be obtained. They are lovely flowers and well worthy a trial.

The best varieties are: *B. Caldasiana*, flowers orange yellow, spotted crimson. *B. Carderi*, flowers large, rose colored, well shaped, spotted brownish purple. *B. Oligantha*, reddish outside, yellow within. *B. Shuttleworhii*, flowers vermilion, green and canary yellow, spotted with dark dotting. *B. Williamsii*, flowers rose colored.

The flowers of these plants are well shaped, or elongated to a funnel shape, and borne in large clusters.

BONAPARTEA: SEE TILLANDSIA BORAGE.

Nat. ord., Boraginaceæ.

B. Officinalis, only pretty for its bright blue flowers. The plant is very coarse. Sow in October in the plains and in March in the hills, where the plants are to remain, as they do not stand transplanting well. Propagated by division or seed.

BORONIA.

Nat. ord., Rutaceæ.

Most elegant and useful shrubs, but unfortunately quite unsuited for the plains, and I do not know if any of the genus have been introduced to the hills, where they should be tried.

Good species of this genus are *B. Crenulata*, *B. Elatior*, *B. Megastigma*, and *B. Serrulata*.

BOUCEROSIA.—*(Pot plant.)*

Nat. ord., Asclepiadaceæ.

B. Umbellata, a cactus-like plant, bearing purple flowers streaked with gold. *B. Crenulata*, like the above, but much more slender. *B. Maroccana*, dark red purple flowers. Grow in good loam, well drained. These plants are allied to *Stapelia* and should be cultivated in the same way.

BOUSSINGAULTIA.

Nat. ord., Chenopodiaceæ.

(Madeira Vine Creeper.)

This is a very pretty and elegant creeper, which does well both in the hills and plains. *Boussingaultia Baselloides* bears white flowers which are fragrant, small, and disposed in clusters 2 to 4 inches long, which are axillary at the ends of the branches. These flowers, as they fade, turn black. The leaves are cordate, smooth, shining and fleshy, some what waxy. These are quick growing twining plants, with stems tinged red, producing tubercles, from which they are propagated.

BOUVARDUA.

Nat. ord., Rubiaceæ.

These do well in the hills, and are very handsome plants, bearing splendid heads of flower. Individual flowers "funnel-shaped, tubular, elongated, be set with velvet papillæ outside and four-parted short limb." Their leaves are borne opposite in whorls.

For green-house cultivation in the hills there are few plants to compare with it in value. *B. Augustifolia*, pale red. *B. Flava*, yellow, in drooping racemes. *B. Jasminiflora*, white, fragrant. *B. Leiantha*, scarlet. *B. Longifolia*, solitary white, 2 to 3 inches long. *B. Triphylla*, scarlet. *B. Alfred Neuner*, double white, tinged rose. Other good varieties are *Dazzler*, *Longiflora flammea*, *Maiden's*

Blush, Vreelandi (Davidson's), one of the best. In Mussoorie I have seen them cultivated in a glazed verandah most successfully in a light rich soil. In the warm months they require a moist atmosphere and lots of water. They should have shade from bright sunshine.

BRACHYCOME.—*(Annual, Half-hardy. Swan River Daisy.)*

Nat. ord., Compositæ.

Free-flowering and very pretty annuals of dwarf growth, covered, when in bloom, with flowers like Cinerarias in form. Suits well for small beds, edgings, pot culture or baskets of rustic work. Sometimes it is called the Swan River Daisy. Its foliage is divided finely, and altogether it is a most desirable annual. *B. Iberidifolia* bears single blue or white flowers. Sow, as other annuals are sown, in pots, and when strong enough plant out permanently in beds or rows nine inches apart.

BREXIA.

Nat. ord., Saxifrageæ.

These are small trees which are handsome for their foliage. Their leaves strike if placed in sand under a hand-glass, or a leaf with a bud attached to it will grow. Their leaves are not unlike some of the rubber trees. *B. Chrysophylla:* leaves of a golden green. *B. Madagascarensis:* leaves oblong, minutely toothed. *B. Spinosa:* leaves lanceolate, 20 inches long, 2 inches broad, and spiny. Cultivated in grass conservatories in the plains.

BRIZA.—*(Grass.)*

Nat. ord., Graminaceæ.

These are of many varieties, some being very pretty. Sow in pots and transplant at the same time as other annuals. *B. Gracilis maxima* and *compacta* grow to about a foot high, and are called shaking grass from their flowers

being connected by hair-like foot stalks, which are constantly in motion with the least breath of air. *B. Media*, *B. Minima* or *Minor*.

BRODIAEA.

Nat. ord., Liliaceæ.

They are half-hardy bulbous plants, which are handsome. Some of them are grown in this country in the hills. *Clevlandi* has pale straw colored flowers, striped black. *Volubilis* bears large bouquets of rose colored flowers at the top of the peduncle, which are very strange on account of its spiral flower stem when not used for climbing.

In the hills they may be planted out-of-doors in a peaty or sandy soil with protection. *Multiflora* bears 15 to 20 very deep blue flowers in an umbel. Increased by offsets when they are matured and the parent plants are in flower. *B. Capitata*, *B. Coccinea*, *B. Congesta alba*, *B. Grandiflora*, *B. Howellii*, *B. Multiflora*.

BROWALLIA.—*(Annual, Half-hardy.)*

Nat. ord., Scrophulariaceæ.

Very pretty little annuals which, when once grown, frequently come up from self-sown seed. A profuse bloomer, covered with beautiful flowers for a long period, in hill-districts as well as in the plains, during the summer and autumn months. Sow in pots of light rich soil at the same time as other annuals, and transplant when strong enough to be handled.

B. Elata grandiflora, sky-blue 1½ feet, large flowers.

B. Elata cærulea, sky blue; 1½ feet.

B. Elata alba, white; 1½ feet.

B. Demissa, light blue and yellow centre, sometimes orange centre; 1½ feet.

B. Cerviakowskii, blue with white centre; 1½ feet.

B. Pendula, bright blue, very pretty; 1½ feet.

BROWNEA.

Nat. ord., Leguminosæ.

Trees or shrubs closely allied to *Amherstia*, and are of great beauty; indeed, they are about the finest of our trees and shrubs. They are propagated by layering. *B. Ariza:* a small tree or shrub of exceeding beauty, bearing enormous drooping heads of the richest scarlet flowers. Leaves pinnate, with 6 to 8 pairs of leaflets, which are oblong-lanceolate and sharply pointed.

B. Coccinea: also an exceedingly handsome small tree, bearing intensely scarlet flowers in smaller heads than the above. Leaves two or three pairs of oval-oblong pointed leaflets.

B. Erecta: very handsome trees, bearing erect heads of rosy scarlet flowers. *B. Grandiceps* bears red flowers in immense heads, or rather spikes, in great profusion. Leaves usually 12 pairs of lanceolate leaflets ending in a tapering point. Branches pubescent.

B. Macrophylla: flowers orange-scarlet, in heads one foot in diameter. Other species, all handsome, are *B. Racemosa*, flowers rose colored in racemes. *B. Rosa del Monte*, flowers scarlet, velvety. *B. Antiquensis*, *B. Latifolia*, *B. Princeps, syn, B. Ariza*, *B. Racemosa*, rose colored.

BRUGMANSIA.—*(Datura.)*

Nat. ord., Solanaceæ.

Splendid flowers of trumpet shape, borne in great profusion. They require some amount of shade and a rich soil, and lots of room for their roots. *B. Knightii* and *B. Suaveolens:* flowers one foot in length, and white.

Propagated by seeds or cuttings. In the hills they do very well, but require to be protected from frost.

BRUNSFELSIA.

Nat. ord., Scrophulariaceæ.

These are elegant flowering shrubs, which do very well in India with little care.

B. Acuminata: a small shrub about 2 feet high, bearing bluish-violet flowers in terminal heads. Leaves oblong pointed, and attenuated at the base.

B. Americana: a shrub about 4 to 6 feet high, bearing at first white flowers, which ultimately turn a yellow or primrose color, and are very fragrant. Leaves obovate, elliptic or lanceolate pointed, and of a dull yellowish green.

B. Undulata: a shrub of spreading habit with waxy leaves, with flower like *Americana*, and afterwards bearing fruit.

B. Eximia: deep purple flowers. *B. Hydrangeæ formis:* beautiful bluish-violet flowers in hemispherical cymes. Height 1 to 3 feet.

BRYONIA.—*(A Climber.)*

Nat. ord., Cucurbitaceæ.

Climbers of little merit. *B. Laciniosa* is cultivated for its foliage, which is rather prettily marked—palmate, five parted, cordate and blistered. Fruit about the size of a cherry, stained and striated yellow. A small creeper. Propagated from seed.

BRYOPHYLLUM.

Nat. ord., Crassulaceæ.

B. Calycinum: a plant with rather fleshy leaves which deviate in form, opposite ovate and crenated. Plant 2 to 3 feet high. The leaves lying on the ground take root and form fresh plants from the notches in the leaves. Flowers pale green, tinged red. Chiefly cultivated as a curiosity.

BUDDLEIA.—*(Shrub.)*

Nat. ord., Logassiaceæ.

Pretty shrubs, propagated by cuttings. *B. Lindleyana* bears pink flowers in *dense racemes*, 4 to 6 inches long, in immense numbers, in March and April. Cut the shrub in November. This plant grows to about six feet in height. *B. Diversifolia* is useful for hedges. *A. Madagascarensis* is a large and rampant shrub, which does as an isolated specimen on a lawn. It has silvery leaves and handsome orange flowers. Any ordinary soil suits it.

BUGAINVILLEA.—*(Creeper.)*

Nat. ord., Nyctagineæ.

These are very magnificent climbers of large dimensions, requiring strong supports. They thrive in any ordinary garden soil without much care. *B. Spectabilis* has small pale yellow tubular flowers, between two pale crimson bracts. One mass of bloom in spring. I have seen one of these growing up a date-palm tree, hanging over its top branches in the form of an umbrella—a most magnificent object. *B. Glabra :* thornless, a large climber, in bloom nearly all the year round, with magenta colored flowers. Another variety of *Glabra* has pink flowers, which bloom only in March; and still another variety of *Glabra* has small deep magenta flowers, which it bears only in the cold season.

B. Splendens bears magenta flowers in the cold season, which are of a bright color. *B. Lateritea* is, I think, a very choice variety and distinct. It bears brick red flowers, and flowers most freely in the cold season. In the hills these require protection in winter. From their great brilliancy they seem to mar the effect of other flowers in the garden, and are best placed as specimens rather away from flower beds: not only for this reason, but also because they are very extensive and rampant growers.

BULBOCODIUM OR COLCHICUM.

(Bulbous plants. For hill-stations only.)

Nat. ord., Melanthaceæ.

A flower known best as the Red Crocus, and may be cultivated in any light soil well drained, when it will come into flower earlier than the ordinary Crocus. It may be grown in-doors, and forms a pretty object to adorn the room.

BURTONIA.—*(Pot plants.)*

Nat. ord., Leguminosæ.

These are very handsome heath-like Australian shrubs, which I am not aware of as having been grown in this country, but are worthy of being tried. Some of them bear seeds from which they can be grown. They are cultivated in a mixture of peat, leaf-mould and sand in equal proportions, with good drainage. *B. Conferta:* violet flowered. *B. Scabra:* purple flowered. *B. Villosa:* large purple flowers.

CACALIA.—*(The Tassel Flower. Annual.)*

Nat. ord., Compositæ.

Very hardy in the plains. Of no great merit in my opinion. Sow at the same time as other annuals.

CAESALPINIA.

Nat. ord., Leguminosæ.

C. Coriaria (The Divi-divi tree). A rather handsome tree, rather unfitted for a garden on account of its size, but its small white flowers are of an aromatic fragrance.

C. Grahami: a creeping plant with thorny stems and pinnate leaves. Leaflets six or seven pairs oblong, deep green. Flowers in dense spikes of orange-scarlet color. A very handsome plant, which is an object of great beauty for a long period, as it goes on flowering for a long time. Propagated by layering during the rains. Cuttings are generally more difficult to strike. *C. Alternifolia:* flowers in orange clusters.

C. Braziliensis: flowers orange, in panicles. *C. Sappana;* flowers in yellow panicles. *C. Serparia;* flowers yellow.

CALADIUM.—*(Bulbous or tuberous. Ornamental foliage. Pot plant.)*

Nat. ord., Adroidacæ.

A very extensive variety of these plants of the Aroid tribe have been introduced into India from time to time, and it would be almost impossible to give a description of them. Easily grown and propagated, they multiply immensely. Being gorgeously colored, they are great favorites, notwithstanding their leaves dying down in the cold season. In this respect, they are different from Alocacias, which latter are evergreen.

In the selection of Caladiums, those should be chosen with the stoutest foot stalks and erect habit of growth, such as *Prince Albert Edward* and *D'Lindly*, *Edward Andre*, *Auguste Carpentier*, and *Rubrum Metalicum*. Entirely different from the rest is *C. Argyrites*, with its minute green foliage and markings of silvery white, in itself quite a gem.

They are easily grown in pots with a free drainage and rich light soil. They are easily propagated by division at the roots; and if there be no more plants than one in the pot (for they must be in growth when thus treated), by dividing that bulb with a knife, leaving some roots and an eye in each division, they can be propagated; only it must be remembered, after these sections are planted, they must be watered very sparingly, or they will be certain to rot off.

Gorgeously as these plants are colored when cultivated so as to be in perfection, they enjoy a moist atmosphere, with slight shade; when exposed to the direct rays of the sun, they are never so fine. On the other hand, they must not be excluded from light, or they will at once grow sickly and lose their highly colored markings. They thrive best in a grass-house or shaded verandah, and when once growing liquid manure

improves the color of the leaves greatly. Annexed is a list of a few out of hundreds of varieties :—

1. *Adolphe Adam.*
2. *Argyrites* (a diminutive variety, but very pretty).
3. *Elsa* (new).
4. *Emile Verdier.*
5. *Hastatum.*
6. *Isadore Leroy.*
7. *Isis* (new).
8. *John R. Box* (new).
9. *L'Aurone.*
10. *L'Antonnie.*
11. *La Perle de Brazil.*
12. *Leopold Robert.*
13. *Madame Alfred Maine.*
14. *Madame Andrieux.*
15. *Madame Mitjana.*
16. *Princess Royal.*
17. *Rasul Pugno.*
18. *Thibautii.*
19. *Vesta.*

CALAMUS.

Nat. ord., Palmaceæ.

Some of these are useful and beautiful as specimens on lawns of large extent, and the smaller species in the plant house. Generally they are too large for the garden. When young—and they grow slowly—they do very well for house decoration.

C. Ciliaris : erect growing, pinnate and covered with soft bristles. Slender growing.

C. Roxburghii. *C. Leptospadix.*

C. Lewisianus. *C. Verticillaris.*

C. Royleanus : A Himalayan species.

CALANDRINIA.—*(Annual or Perennial.)*

Nat. ord., Portulaceæ.

Very pretty flowering plants. *C. Grandiflora* and *C. Dicolor* are good for edgings : and *C. Umbellata* is of a trailing habit, and produces rosy violet flowers in bunches. These may last for some years in hill-stations after sowings, but in the plains only do well as annuals, though with a great deal of trouble and care they may live out the hot season and rains, but I think they are best renewed by seed yearly. Sow

the seed in October in the plains, and in the spring in hill-stations, when the weather is warm enough. *C. Meziesii*, deep purple crimson, is a handsome variety.

CALCEOLARIA.—*(Pot plants for hill-stations.)*

Nat. ord., Scrophulariaceæ.

These are most beautiful plants, especially the herbaceous varieties, which are remarkable for their large spotted flowers. They are exclusively conservatory plants in India. The half-hardy plants are bushy and compact, and flower more luxuriantly, and are more prized by some, though their flowers are smaller. These are suited for the conservatory, and are easily grown in the hills. Cuttings should be taken in October and placed under a hand-glass in sand or very light mould. In spring (early), these should be transplanted singly in pots, as I do not think they will give very satisfactory results cultivated out of doors. As they grow they should be stopped repeatedly, so that they form bushy plants. *Calceolarias* may be grown very satisfactorily from seed sown in October or in March, though autumn plants are the best either from seed or from cuttings. The seed germinates best without heat. The pots must be well drained. The compost should be half sand, leaf-mould and turfy soil. Keep dark or cover with a pane of glass till the seed germinates, then expose to light. When the seedlings are strong enough, prick out and plant in pots or pans. Never let them get dry. The atmosphere should be moist. Fumigate at once, if green fly attacks them, with sulphur, or the Lothorion cone. Finally transplant into their blooming pots singly. Never over water them, or they may suddenly die off. Care must be taken not to expose them in frosty weather.

CALATHEA.—*(Foliage plants.)*

Nat. ord., Scitamineæ.

These plants are only distinguished from Maranta by botanical characters, and they are often confounded. They

delight in a good rich soil, open, well drained, and with some sand in it. They are easily increased by division and do well in India, where they are in their greatest beauty in grass conservatories. The following are some of the best: *C. Baraquinii, C. Fasciata, C. Illustris, C. Leopardina, C. Picturata, C. Micans, C. Lindeni, C. Massangeana, C. Nitens, C. Pardina, C. Tubispatha, C. Wallisii, C. Van Heckei, C. Warscewiczii, C. Zebrina.* In the hills these require to be grown in a warm conservatory.

CALENDULA.—*(Marygold Annual.)*

Nat. ord., Compositæ.

There are many varieties of this flower, varying from straw color to the deepest orange, both single and double. English seeds do not always germinate, but seed kept from acclimatized plants does very well, and is not liable to degenerate in the least, so I should recommend every one to store the seeds, even though he may obtain English seed yearly. If English seed be used, the cold weather should fairly have set in before they are sown, and then they should be put down where they are to stand, for they do not bear transplanting well: but if they are sown early, it should be in pots, and when two inches high, be transplanted very carefully.

C. Officinalis, Grandiflora, Sulphurea: improved, very compact double flowers, sulphur yellow.

C. Meteor: imbricated, deep brown orange on a pale straw, almost white ground.

C. Orange King: faultless in form, deepest orange. There are many new varieties.

CALLIANDRA.—*(Shrubs.)*

Nat. ord., Leguminosæ.

Beautiful shrubs. Flowers usually borne on stalked globose heads, with small corollas hidden by the filaments and stamens, which are numerous. They do best in a rich soil.

Propagated by cuttings put down in sand under a hand-glass. *C. Longipes, C. Brevipes, C. Harrisi, C. Haematocephala, C. Protoricensis, C. Tweediei.* The leaves of these plants are bi-pinnate, with the leaflets varying in size and number.

CALODENDRON CAPENSIS.—*(For the hills only.)*

Nat. ord., Rutaceæ.

This is a tall growing tree, which is handsome for its flesh colored or pink flowers, in large panicles. Altogether this is a fine tree. Raised from seed or cuttings. Height 40 feet. This has never been successfully cultivated in the plains, and I do not know if it has been tried in the hills.

CALLIOPSIS.—*(Annual, hardy.)*

Nat. ord., Compositæ.

A free-flowering and showy annual. Very pretty in borders, with the tall and the dwarf varieties mixed, planted in ribbons. Sow them in pots and transplant to the border. They should be sown at the same time with other annuals. *C. Filifolia burridgii* is the most graceful: and perhaps the most showy variety is *C. Bicolor grandiflora.* Others are *C. Nana, C. Diversifolia. C. Ackermannii* is a tender variety from America.

CALLIPSYCHE.—*(For the hills.)*

Nat. ord., Amaryllidacaea:

So called from Kallos—beauty, and Psyche—a butterfly, alluding to its flowers. They are ornamental bulbous plants, which require to be grown in shade in a compost of sandy loam and leaf-mould. They are propagated from seed, and offsets when in growth. They require plenty of water while growing and should be kept moderately dry in winter (not dried off), though the foliage should die down. *C. Aurantiaca,* bears on a scape many flowers, deep golden yellow, with green stamens. Leaves oblong acute. *C. Encrosiodes,* flowers scarlet and

green, with very long incurved stamens on a ten-flowered scape. Leaves few, pitted and tessellated, about four inches wide. *C. Mirabilis*, flowers greenish yellow, with stamens very long and spreading on all sides: about 20 or more flowers in an umbelate head, on a scape 3 feet high.

CALLISTEMON.—*(Bottle-brush.)*

Nat. ord., Myrtaceæ.

C. Speciosus. The name Callistemon is derived from Kallos—beauty, and Stemon—a stamen. The flowers have a profusion of stamens, of which they seem to be chiefly composed. These are of a beautiful scarlet color, just like a bottle brush. Leaves lanceolate pointed, rather silky when young. The shrub is about 5 feet to 10 feet high. *C. Linearis*, scarlet velvety pubescence over the flowers. Leaves stiff, linear and acute. *C. Salignus*, not so handsome, straw colored flowers, spicate. Raised from cuttings.

CALLIRHOE DIGITATA.—*(Annual, hardy.)*

Nat. ord., Malvaceæ.

A showy little annual with pink blossoms. Sow the seeds in the border in October in the plains, and let it remain where sown. In hill-stations sow the seeds as other annuals are sown, in pots, and transplant them, having sown the seeds at the same time as other annuals. Seed may be saved from the plants from year to year without fear of the flowers deteriorating. Not much grown now.

CALOPHYLLUM.—*(Sultana or Alexandra Laurel.)*

Nat. ord., Guttiferæ.

C. Inophyllum: a large tree with fine large elliptical polished green leaves. Bears drooping racemes of very fragrant white flowers, followed by large seeds from which it is propagated. *C. Calaba:* flowers white, sweet scented, in loose racemes. Leaves obvate or oblong.

CALOCHORTUS.—*(For the hills.)*

Nat. ord., Liliaceæ.

These are very handsome bulbous plants, called Maraposa lilies. Plant in the hills in a frame in February. They require a good depth of soil and not excessive moisture, so that they must not be grown in the open ground.

Their cultivation is attended with difficulty, as nothing is more prejudicial than to receive their bulbs in a dry state. They must be fresh, and this is the difficulty of importing them.

CALONYCTION.—*(Annual, tender creeper, sweet-scented.)*

Nat. ord., Convolvulaceæ.

C. Grandiflorum, or moon flower, bears flowers much like a Convolvulus, white and fragrant. *C. Muricatum*, like the last, has white flowers, not scented, but it is a thicker stemmed plant. Flowers of both varieties open only in the evening and close in the morning. Sow the seeds at the same time as other annuals; and if it be in the plains, in the borders where they are to stand; but in colder climates, sow the seeds in pots and transplant to the border.

CALOTROPIS.

Nat. ord., Asclepiadeæ.

A genus of bushes, very common, and to be found growing wild in India. Known to natives as *Madar* and *Akanda*. *C. Gigantea*, flowers a mixture of rose and purple in umbels. *C. Hamiltonia* and *C. Peocera*, white.

CALYCANTHUS.—*(Allspice.)*

Nat. ord., Calycanthaceæ.

C. Floridus, not very ornamental. Its flowers are somewhat apple-scented. *C. Glaucus*, flowers purple, very bright, and not highly scented. *C. Lavigatus*, flowers bright purple. Leaves rather glabrous, bright green above, pale beneath.

C. Occidentalis,* flowers brick-red, sweet-scented, 4 inches broad. Leaves ovate, cordate, pointed. This is the most ornamental of these plants. It grows in any good garden soil. Propagated by layers.

CAMASSIA.

Nat. ord., Liliaceæ.

C. Esculenta is an excellent, hardy little bulbous plant, which suits the hills, producing handsome spikes of blue flowers 1 to 2 feet. They love a light dry soil. Obtainable in bulbs. *C. Esculenta*, flowers blue. *C. Leichtlini*, flowers creamy white. *C. Fraseri*, flowers pale blue. A slender plant.

CAMELLIA.

Nat. ord., Ternstræmiaceæ.

Shrubs of the greatest beauty, much coveted by all who love plants, but not always procurable in Calcutta, though they are more frequently imported now than they used to be. Some florists grow them entirely in peat, and some in strong loam approaching to clay. The best soil is two parts fibry peat, one part fibry loam, one-sixth part silver-sand, and the same quantity of rotten wood, or leaf-mould.

They should be kept in a temperature of from 55° to 60° till their growth is made and their buds formed, and during this time should be frequently syringed, and kept clean in a humid atmosphere.

Towards the end of April they should be removed to a cool situation and then placed out of doors in a sheltered situation. If they are grown in the plains they will never thrive out of doors, unless it be in the very coolest localities. They should be watered daily, alternately with water and weak liquid manure. By October (in hill-stations) they should be placed under glass once more, or in a verandah, and with this treatment their blossoms should open in November or December. When they have done flowering they should be placed in larger pots. In the plains, Camellias

should be grown entirely in grass-houses or orchid-houses, especially where west winds prevail, and only be exposed when their buds are setting, when they must be protected from heavy rain. When in flower they should be well watered. There are many varieties to select from.

Camellia Japonica may be obtained from seed, but is also propagated by cuttings and layering.

Camellias thrive well and make good growth in hill-stations with a little care.

CAMÖENSIA.

Nat. ord., Leguminosæ.

C. Maxima, of comparatively recent introduction to Calcutta. A magnificent and gorgeous climber, having few rivals. This species is the largest flowering of the genus. It requires a rich loam and leaf-mould. Cuttings root in sandy loam if placed under a hand-glass. It flowers in axillary racemes. Flowers yellow tinted with gold, veined, and cut at the mouth. The sepals much recurved, and calyx tube about 5 to 6 inches long or more. It is yet rare in Calcutta, though introduced some years ago.

CAMPANULA.—*(Annual and perennial. Pot and bedding plant.)*

Nat. ord., Campanulaceæ.

These are a very large variety of plants extensively grown in England and on the Continent, chiefly as pot plants. They have been much improved of late years. Some of them are of stately growth, while others are of compact habit. Sow seeds of *Campanula* in October in the plains, and in March and April and again in September and October in hill-stations, in a little bottom heat. When strong enough prick them out and pot them separately. There are a great many varieties.

C. Carpatica is a perennial; flowers blue.

C. Carpatica alba, a perennial, white.

C. Media calycanthema is a biennial; blue variety and white variety; the cup and saucer flower.

C. Media or double Canterbury bell is biennial.

C. Persicifolia blackhousi is a perennial, with the largest flowers of this type.

C. Persicifolia grandiflora coerulia, like the above, with blue flowers.

C. Pyramidalis compacta (Syon House variety) is a dwarf perennial of great merit, with large flowers.

There are a great many varieties, of which probably the above mentioned are the most cultivated.

These, though they do in the plains, are best in the hills. In the plains they are difficult to keep through the rains.

CAMPSIDIUM.

Nat. ord., Bignoniaceæ.

C. Chilense, flowers rich orange color; corolla tubular; leaves pinnate, dark shining green; an extensive climber, but very handsome. *C. Filicifolum*, a plant of more recent introduction, with fine feathery foliage, the flowers being tubular, of an orange color. A rich loam with leaf-mould suits it. Propagated by layering in the rains. Both the above are very handsome plants, especially the latter.

CANISTRUM.

Nat. ord., Bromeliaceæ.

The name is derived from *Canistrum*, a basket, its flowers being held as if in a basket. I am not aware if this has been introduced, but they should be readily grown in the plains by just the same method of culture being adopted as that for *Billbergia*, which see. *C. Aurantiacum*, flowers orange-yellow. Leaves toothed. *C. Eburneum*, flowers whitish green, having the appearance of eggs in a basket. Leaves tufted and mottled, those in the centre being cream colored.

C. Roseum and *C. Viride* are both less attractive than the foregoing.

CANNA.—*(Indian Shot: shrub.)*

Nat. ord., Cannea.

This genus contains a large variety of public favourites, growing more fashionable daily, and are receiving at the hands of florists of to-day a great amount of attention, and rightly so, as some of the new varieties, called the Orchid flowered or Giant Group, have been introduced, which are thoroughly valuable. The first step towards the improvement of the old varieties were the French Cannas; after which were introduced the new Orchid flowered, which are certainly an improvement in every way on the French varieties, of which Mr. P. Lancaster, Secretary of the Agricultural and Horticultural Gardens, Calcutta, writes in the "Indian Gardener," describing seventeen of the Orchid flowering and thirty-seven others, many of which have been raised at the Alipur Gardens.

The foliage of the Canna, speaking generally of the genus, is highly ornamental and tropical: and added to it now the large flowers, are decidedly an addition to our Indian gardens.

Mr. Lancaster writes: "The Canna is, in my opinion, about the best plant for general purposes. A few clumps in a garden will produce spikes of flowers all the year round, and will give more satisfaction than the majority of plants, as they are so easily managed and require little care." In the hills they begin to flower in May and June, and go on doing so till cold sets in; the plants should then be allowed to die down gradually. The roots can then be stored away till March and kept moderately dry. They are easily propagated by division of the roots and from seed. The seed is very hard, and, unless steeped for some time in warm water, is liable to lay dormant in the soil and be destroyed by insect pests. It is best, therefore, either to steep the seed for some hours before sowing, or to plant it in boxes, which can be kept well watered.

They are best planted in the plains, in some spot where they are sheltered from the evening sun. In the dry months

of March, April, May, and part of June, in Mussoorie and Simla, when the weather is hot, they are all the better for some shade during the evening. At this time, too, they require copious watering, and when in full growth and flower are all the better for liquid manure, both in the plains and hills. Both flower and foliage benefit in color much by it, and a good rich soil suits them best. If the soil is not light, add sand, leaf-mould and cow-dung manure.

The Orchid Flowering Cannas have attracted much notice by every one who has seen them, especially at the Government Botanical Gardens, Calcutta, where there is at present the finest collection of them to be seen. I therefore give a list of them first and foremost, as they are certain to become favourites throughout India before long; but, before doing so, must explain to residents of hill-stations that all Cannas are quite hardy if carefully covered over with a good pile of leaf-mould or other manure eight inches thick or more during the winter months. In autumn withhold water till they die down to the roots, then cover up carefully. If grown in tubs or boxes, store away the roots in the soil.

If you wish to be very careful, there is no difficulty in digging up the roots and storing them away in sand after the plants die down; then planting them out in the open, in the month of March, when there is no further fear of frost—say after the 15th or 20th of the month.

In Mussoorie I have had some Cannas out all last winter under protection; they are sprouting now at the close of March.

"GIANT" OR "ORCHID" FLOWERING CANNAS OF THE NEW TYPE.

1. *C. Africa.*—Scarlet with yellow centre; flowers 5 to 6 inches. Foliage green, 4 feet.

2. *C. Alemannia.*—Very large spikes, and flowers brownish-scarlet: 7 inches, in the rains 8 to 8¼ inches. Foliage green, 5 feet. A grand variety.

3. *C. America.*—Bright fiery red, streaked salmon faintly, orange centre; 5 inches. Foliage dark bronzy-red. Height 5 feet.

4. *C. Asia.*—Flowers golden yellow and scarlet centre; 5 inches. Foliage green, 5 feet.

5. *C. Attika.*—Flowers salmon red with darker centre; 5 inches. Foliage bronzy-red, 5 feet.

6. *C. Austria.*—Flowers canary yellow, dotted faintly with red; 6 inches. Foliage sea green, 5½ feet.

7. *C. Bavaria.*—Flowers yellow, spotted scarlet, Mr. Lancaster remarks, Cattleya-like in shape and size; 6 inches. Foliage green, 5 feet.

8. *C. Borussia.*—Flowers yellow with fiery red blotches; 5 inches. Foliage green, 5 feet.

9. *C. Burgundia.*—Flowers deep golden yellow, spotted scarlet; 5 inches. Foliage dark green, 5 feet.

10. *C. Crown Prince of Italy.*—Flowers purplish-scarlet; 4 inches. Foliage green, 5 feet.

11. *C. Edouard Andre.*—Flowers fiery red, bordered and blotched orange yellow. Foliage dark bronze. Height of plant 5 feet.

12. *C. Iberia.*—Flowers golden yellow, bordered red; 5 inches. Foliage green, 5 feet.

13. *C. Italia.*—Flowers in huge bunches, as many as 20 having been counted on a spike; color vermilion red, deep golden border; 6 inches. Foliage dark green. Height 5½ feet.

14. *C. La France.*—Flowers crimson scarlet, suffused yellow at the edges: 5½ inches. Foliage bronzy-red. Height of plant 5½ feet.

15. *C. Pandora.*—Flowers fiery red feather with a broad border of gold: 5 inches. Foliage of bronzy-red. Plant 5 feet.

16. *C. Partenope.*—Flowers deep bright orange; 5 inches. Foliage dark green. A distinct variety. Plant 5 feet.

17. *C. Princess Lœtitia.*—Flowers red, tinted pale carmine; 4 inches. Foliage green. Plant 3 feet. A distinct variety.

This is a list of a good many varieties probably now in India, abbreviated from Mr. Lancaster's description in the "Indian Gardener" of the 27th January, 1898. Older varieties of merit, of French origin, and some raised at the Horticultural Gardens, Alipur, etc., are *Madame Crozy*, bright scarlet, edged yellow, flowers 4 inches to 5 inches in the rains, deep green foliage, plant 4 feet: one of the best varieties of the older kinds.

Queen Charlotte.—Flowers yellow with scarlet centre. Foliage deep green, 3 feet.

Star of 1891.—Flowers fiery scarlet, shaded mahogany, edged gold, in large bunches. Individual flowers 4 inches. Plant only 2 feet, delicate. Foliage green.

Star of India.—Raised at Alipur, by Mr. Lancaster, in all respects like Queen Charlotte, but flowers bright clear yellow and panicles more dense and branched.

Princess Alice.—Flowers deep yellow, fiery red centre, 4 inches. Foliage green. Plant 4 feet. Raised at the Society's Gardens.

L'Archêque Goethals.—Flowers rich orange red, variable in shape, on drooping, sometimes erect spikes, 4 inches. Height 3 feet. Foliage dark green. Raised at the Society's Gardens.

Ida.—Flowers pale citron yellow, much crimped and evanescent, but 5 inches in diameter. A delicate plant and not good for amateur cultivation. (May be useful in producing new varieties: as also *Flaccida var. florida*, whose flowers last only for 10 or 12 hours.)

Countess of Elgin.—Flowers drooping, bright salmon, 7 to 9 flowers in a spike, in large heads, each flower being 6 inches in diameter. Foliage green, with slight bronze shades. Height 4 feet. Raised at the Society's Gardens. A good variety, one of the best of sturdy habit: as also *Cleopatra*, raised on the Society's Gardens. Flowers 4 to 5 inches, well expanded, salmon red. Height 3½ feet. A sturdy variety, clumping well.

Lady Mackenzie.—Flowers apricot, fading at the edges to gold. As Mr. Lancaster remarks, this plant, when only 6 inches high, bears flowers. Height of plant 2 feet, and foliage dark green. Sturdy.

Morisca.—Raised on the Society's Gardens. Flowers vermilion scarlet, 4 inches in diameter, borne in abundance in the form of a round head. Foliage green.

Carmen.—Flowers orange scarlet, edged gold, in dense large heads. Foliage dark green. Raised on the Society's Gardens.

Doris.—Flowers dark ruby colored, 4 inches, well expanded. Foliage dark green. Plant 4 feet. Raised on the Society's Gardens.

Ehmanni.—Flowers crimson carmine, 3 to 4 inches, drooping. A monster in height, 6 feet to 11 feet. Foliage dark green. Raised in Lucknow.

George King.—Flowers cerise, 4 inches. A new color. Foliage dark green. Height 5 feet.

This will show how much we are indebted to the Society's Gardens for the best of these varieties.

Childsii.— Flowers yellow, spotted carmine, 3 inches Foliage sea green. Height about 5 feet. Probably one of the best of the imported varieties.

There is no doubt, however, left that the Giant or Orchid Flowering varieties are the most ornamental in every way, though at present being new they are somewhat dear, but as they are so readily propagated, even now they are within the means of every one.

Grown in tubs near the house, though perhaps they will not reach the perfection they would attain in the open ground, still both foliage and flower are such that they stand second to no other class of plants for ornamenting and decorating the entrance to our homes. Added to this, they are cultivated with such ease.

I hope that many may be induced to cultivate them, as well as the best of the older kinds, which Mr. Lancaster

recommends, namely, "*Carmen, Countess of Elgin, Doris, Ehmanni, Flaccida var. Florida, Geo. King, L'Archeque Goethals, Madame Crozy, Morisca, Queen Charlotte (or Star of India), Secretaire Nichols,* and *Souvenir de F. Gaulin*": but as he says, in dry weather and in places where there is little moisture, "out of the rains they dwindle" and therefore require much more attention as to watering, and if this occurs in Bengal (of which there is no doubt), much more so will it happen in Behar, the North-West, and Punjab. I therefore recommend the Giant varieties, which are more suitable and desirable in every respect, and I may with safety say "they have come to stay," as the florist expression is, for they cannot be supplanted easily by anything we know up to date in India.

CANTHIUM.

Nat. ord., Chinconaceæ.

C. Odoratum.—A small low-growing shrub of rather ornamental appearance, bearing fragrant flowers, which are white. Propagated by layering and cuttings.

CARAGUATA.

Nat. ord., Bromeliaceæ.

Caraguata are pineapple-like plants, which should be cultivated after the same manner as *Bilbergias*, and require the protection of a grass conservatory in the plains. They are allied to *Tillandsia*, and are cultivated for their foliage During the warm months they require a copious supply of water. They are best grown in a compost made up of charcoal, leaf-mould, a little pounded mortar, and sand. This plant has been found difficult to cultivate in the plains. In the hills it must be cultivated in a warm conservatory.

CARALLUMA.

Nat. ord., Asclepiadaceæ.

These plants have something of the appearance of a Cactus, or more like a *Stapelia*. Stems tetragonal, toothed along

the raised angular edges. A single flower rising from the axil of the teeth. *C. Adscendens:* flowers drooping, variegated, purple and yellow. It has slender branches, each bearing a single flower on the top. *C. Fimbriata:* flowers drooping, white and pink, curiously fringed, marked with transverse purple lines, pale yellow beneath. They should be cultivated in the same way as *Stapelia*, and are propagated by cuttings. They should be cultivated in pots.

CARDIOSPERMUM.—*(Baloon vine.)*

Nat. ord., Sapindaceæ.

In this country it may be seen growing as a common weed. Its flowers are insignificant, and it bears inflated capsules much like Cape Gooseberries. Its foliage is graceful, but is hardly worthy of a place in the garden. Raised by seed at any season.

CARLUDOVICA.—*(Palms.)*

Syn. Ludovia, Salmia.

Nat. ord., Cyclanthaceæ.

Low growing palms which are thornless and highly ornamental. Splendid for subtropical gardening. They are easily grown. *C. Atrovirens, C. Drudei, C. Ensiformis, C. Humilis, C. Palmata, C. Purpurata, C. Rotundifolia, C. Wallisii.*

CARNATION.—*(Dianthus Caryophyllus.)*

Nat. ord., Caryopyllaceæ.

See *Dianthus.*

CARYOTA.—*(Palms.)*

Nat. ord., Palmeæ.

There are about a dozen species of these palms. They have fin-like leaves and are bipinnate. They attain almost their full height before flowering. *C. Cumingii,** one of the best. *C. Maxima, C. Propinqua, C. Purpuracea, C. Rumphiana,** *C. Sobolifera,* and *C. Urens,* which is the Indian variety.

CASSIA.—*(Trees.)*

Nat. ord., Leguminosæ.

Only a few of this genus are deserving a place in the garden. *C. Fistula,* known as *Amaltas* by natives, has undoubtedly the most ornamental character, and when in flower, in May and June, is a splendid mass of yellow flower, which Firminger considers superior to the Laburnum, and I fully concur in the opinion. It is truly lovely when in flower. *C. Marginata* has rose-colored flowers which are very pretty. *C. Florida* is a new variety introduced to the Saharanpur gardens: a native of Java. *C. Alata,* or *Dad-murdun* of the natives, is a handsome shrub, with fine large foliage and yellow flowers.

CASTANOSPERMUM.—*(Moreton Bay Chestnut.)*

Nat. ord., Leguminosæ.

C. Australe does not seem to grow in Calcutta, but does well up-country and in the North-West Provinces. Its leaves are impart pinnate, with leaflets broad and smooth. Its flowers are crimson and yellow. A large tree growing to 40 feet or more, and exceedingly handsome. Propagated from cuttings of ripened wood placed in sand in the rains.

CASUARINA.

Nat. ord., Casuarinæ.

C. Equisetifolia: a tall tree, very well known on the plains of India. Quite unfit for private gardens. Known by natives as *Bara-jhao.* This is known to Europeans as Beef-wood or She-oak, and is often used for forming avenues.

CATALPA.

Nat. ord., Bignoniaccæ.

Catalpa are mostly trees, and some are shrubs. *C. Speciosa* bears rather large white, purple, brown and yellow flowers in large panicles, and is a handsome tree with cordate

leaves. Not common yet in this country. Propagated by seed and layers. *C. Bignonioides*, the corollas of which are white, speckled purple and yellow, is an American plant, which is handsome. Height 20 feet *(Syn. C. Syn. ingæfolia.)*

CATESBAEA.—*(Lily Thorn.)*

Nat. ord., Rubiaceæ.

C. Spinosa, a plant that is pretty when in bloom. Its leaves are small ovate acute at both ends. A very thorny shrub. Its flowers hang suspended from it, are pale yellowish-green, 3 to 4 inches long, notched at the mouth. Propagated by cuttings during the rains.

CELOSIA CRISTATA.—*(Cockscomb. Half-hardy annual.)*

Nat. ord., Amaranthaceæ.

Of cockscombs there is a large variety; some varieties red, some golden, some yellow, and others of different shades of crimson and pink. There is a variety of variegated cockscomb, which is a very fine variety, silver and rose. The dwarf varieties are exceedingly handsome, with large compact flowers. The larger varieties grow unsightly sometimes from having their stems almost bare, and I think the German dwarf sorts most elegant in form as well as more brilliant in color. Seeds of *Celosia* should be sown late in July and chiefly in August, in pots, in the plains; and in April or May in hill-stations: if sown early there, the pots the seeds are sown in should be plunged into a hot-bed, and a humid atmosphere attained, by keeping them under glass. When the plants are strong enough, plant them out in beds, either in the plains and hill; or at the back of borders, if of tall varieties. They should be carefully protected from frost, when there is any chance of it, by covering them with matting. They delight in a rich soil and a medium amount of moisture. *All aglow*, orange scarlet, dwarf; *Silver and rose*, variegated combs; *Glasgow, prize*, dwarf in height, but very large in heads, crimson; *Golden beauty*, golden, one foot high; *Japonica*, branching,

pyramidal ruffled combs *Queen of Dwarfs*, only 8 inches high, combs often 10 inches across, dark scarlet. Of the *Celosia* plumed varieties—*Crimson ostrich plumed*, large crimson plumes; *Golden ostrich plumed*, Golden plumed; *Mixed colors*, *Ostrich plumed crimson*, *Orange*, *Yellow*, *Rose*.

CENTAUREA.—(*Cornflower. Annual, hardy: sweet-scented sometimes.*)

Nat. ord., Compositæ.

C. Cyanus is the blue-bottle of our fields in England, sometimes called the cornflower from being found growing wild in cornfields. A most useful annual. There is a white variety too, the former being of a light blue color. *C. Rosea* has rose colored flowers; *C. Americana* is a variety with lilac flowers; *C. Suaveolens* has yellow flowers, and *C. Mochata*, or Sweet Sultan, the prettiest of the variety, is a delicate looking flower, thistle-like and purple. Sow the seeds in the open border where they are to remain, in October, in the plains, and in hill-stations at the same time with other annuals in spring. This flower has been much improved, and there is now a fine new double flowered variety, which has been fixed, called *Centaurea florepleno*, much like the Gillardia of the double variety. *Emperor William* is a single dark blue. *Victoria* is another new single variety. *Centauria*, mixed all colors, single varieties; *C. Muschata alba*, white; *C. Purpurea*, purple; *C. Coerulia*, blue, yellow and mixed colors; and *C. Candidisima*, silver foliaged variety.

CENTRADENIA.

Nat. ord., Melastomaceæ.

These herbaceous small plants bear flowers, white or pink, generally in axillary racemes. They require a light soil manured with leaf-mould. Cuttings strike easily.

C. Floribunda, with dark red stems, and leaves narrow lanceolate, 1 to 2 inches long. Flowers pink, in racemes, 2 feet high.

C. Grandifolia, flowers pink. *C. Rosea*, flowers pink, in terminal racemes, sub-corymbose. Leaves ovate-lanceolate, unequal sided, 1 foot high. Their foliage is pretty, as well as their flowers.

CENTRANTHUS.—*(Annual: Red Valerian.)*

Nat. ord., Valerinaceæ.

Not a very showy plant, and hardly seen now. Sow at the same time with other annuals. The flowers are very small, borne in bunches, and the plant about 2 feet high. Sow in pots, and when strong enough plant in beds.

CENTROPOGON.—*(For the hills.)*

Nat. ord., Campanulacea.

These are very handsome pot plants bearing tubular flowers, which will do very well in the hills, and flower in the winter months.

They are of semi-procumbent habit, and are therefore useful to grow in baskets suspended from the roof, where they may be seen to advantage. *C. Fastuosus*, flowers rose colored, tubular, bent. Leaves broadly lanceolate. *C. Lucyanus*, rosy carmine, tubular. Leaves oblong-lanceolate. They are easily propagated by cuttings placed in sand, and afterwards grow well in leaf-mould, sand, and a little soil. They require lots of water, especially in their growing season. In winter, water sparingly. The above varieties will do in the hills, and *C. Cordifolius*, a stove variety, might be tried in the plains. It bears rose colored flowers.

CENTROSEMA.

Nat. ord., Leguminosæ.

These are handsome creeping plants of considerable size, which may be propagated from seed or rooted runners.

C. Grandiflora bears purplish flowers; *C. Plumeri*, white flowers with a puce spot; *C. Virginianum*, purple flowers.

CERBERA.—*(Ordeal tree.)*

Nat. ord., Apocynaceæ.

C. Manghas, a small tree or shrub which is handsome, with scattered entire leaves, oblong-lanceolate, acute and tapering towards the apex, glossy. It bears white flowers with a pink centre, in terminal panicles, which are large and open. *C. Fruticosa*, flowers white and pink.

CERCIS.—*(Judas tree, or Love tree.)*

Nat. ord., Leguminosæ.

C. Canadensis. The tree, it seems, from what Firminger says, to be unsuited to Calcutta, as Dr. Voigt stated that it had not flowered there, but I doubt if it would not do very well in the Upper Provinces and North-West Provinces. They should be grown for their peculiar beauty, as their branches, when in flower, are covered with bloom, and the peculiar form of the leaves, which appear after the flower, have a charm in themselves. Flowers red from the fascicles and trunk. Leaves cordate-acuminate. *C. Siliquastrum*, flowers bright purple, borne as in the above species. There are varieties of this species which bear white and flesh colored flowers. The wood of this tree is handsomely veined black. Height about 20 feet. These trees are generally raised from seed sown in spring, and begin to bear flowers in their third or fourth year. The seed should be sown in light soil. They may be propagated by cuttings, but plants from seed do best.

C. Chinensis is much like *C. Canadensis*, but bears larger flowers.

CEREUS.—*(Cactus. Torch thistle.)*

Nat. ord., Cactaceæ.

These are fleshy, grotesque-looking plants, most of which can be readily cultivated in this country. They have handsome flowers, and are on that account much grown, especially on the continent. They are easily grown, as most Cactus are

They will grow anywhere where the winter temperature does not fall lower than 50 degrees and in summer 90 degrees. The soil most suited to them is ordinary fibrous loam one half, and the other half of sand, broken bricks and rubbish in equal parts. All this should be mixed and used moderately dry. They must have perfect drainage, without which they will not succeed. They are best grown in a shady situation, such as a grass plant house. Water moderately, both in winter and summer.

The following notes apply to all Cactus. They are propagated by three methods, namely, by cuttings or offsets, and by grafting, also by seed.

Cuttings should be made with a sharp knife, and laid on a shelf to dry the wound thoroughly; then some moss may be tied round the cutting, and it may be laid on a shelf, exposed to partial sun, in the grass conservatory till roots are emitted. The moss must not be more than very slightly damp from syringing. When rooted, they may be planted in sandy soil and only syringed.

Grafting is only adopted with delicate kinds, which do not grow well on their own roots. The stocks generally used for this purpose are *Cerus tortuosus* and *C. Peruvianus;* according to the species they suit best. They readily unite with each other.

In the case of slender plants, wedge grafting is adopted, if broad horizontal sections are adopted, and they are tied together, not too lightly, with matting. They are not often propagated by seed, as it is a slow way of procuring them. When seed is sown, they should be grown in sandy soil and put in a plant house till germinated, then watered cautiously, and may be more exposed.

C. Speciosissimus, C. Coecineus, C. Grandiflorus, C. Nycticalus, C. Pleiogonus, C. Sempentinus, C. Macdonaldi, C. Pentagonus, C. Serpentinus, C. Fimbriatus, C. Flagelliformis,

C. Fulgidus, and *C. Quadrangularis* are among the best. Some of those mentioned are night blooming, but all are exceedingly handsome.

CERINTHE.—*(Honey-worth.)*

Nat. ord., Boraginaceæ.

C. Maculata, a perennial which is pretty, with a yellow corolla spotted with five dark dots on the tube. The leaves are smooth, cordate and ovate. Plant 1 to 2 feet high.

C. Major is an annual with a corolla yellow at the bottom and purple at the top. Leaves cordate-ovate, fleshy, toothed, and clasping the stem, smooth and dotted with white, and rough beneath.

C. Retorta, an annual with a yellow tube and violet limb. Leaves somewhat spathulate and mucrone, beset with white warts both above and below, stem clasping.

Sow the seed in the plains in October and in the hills in March and April.

CEROPEGIA.

Nat. ord., Aclepiadaceæ.

These are pretty climbing plants with most curious and pretty flowers Some of them are bulbous plants, to which belong *C. Bulbosa*, which I do not think has been introduced yet, as also *C. Elegans*, with fibrous roots.

C. Gardnerii, which is a fine species, may be obtained at the Agricultural and Horticultural Society's Gardens, and has creamy white flowers with purple blotches. Leaves acuminate glabrous. A native of Ceylon. The flowers are much narrowed below, but much widened above, and almost globose or turning in at the top, where the edges are beset with thin longish hairs.

Other good species are *C. Barklyi*, *C. Elegans*, *C. Sandersoni*, *C. Thwaitesii*, which have not been introduced Most of these plants die down after flowering, and spring up again from their roots. Propagated by division of the roots, or

from cutting. Loam and leaf-mould is what the plants should be grown in. While dormant these plants should be watered very sparingly, and particularly the bulbous sorts.

CEROXYLON.

Nat. ord., Palmaceæ.

Handsome palms of South America. *C. Andicola* and *C. Niveum* are the two species known to us, and which require the shelter of a grass conservatory, and probably more shade than most palms. *C. Andicola*, the wax palm of New Grenada, does not seem to grow out in India so far as it has been tried.

CESTRUM.

Nat. ord., Solanaceæ.

These are a most ornamental and useful genus of shrubs, either as pot plants or climbers. To do well, they require lots of room for their roots and a moderately rich soil. They are propagated by cuttings and seed.

C. Foetidissimum, a shrub of about 6 feet in height, which is a pleasant object, but the leaves when bruised have a foetid smell. Flowers thimble formed, of a light dirty yellow color.

C. Aurantiacum, a handsome shrub with orange flowers. Sessile spicate, panicled. The leaves are oval and undulated.

C. Elegans, sometimes known as *Habrothamnus elegans*, with purplish red flowers. A variety of this, called *Argentea*, is a handsome climber with variegated leaves, the surface of which is creamy white, tinged rose, and blotched green in irregular patches.

C. Parqui is a handsome shrub, with whitish-yellow flowers in panicles, very fragrant and night blooming.

C. Harsutum is another night bloomer with greenish-yellow fragrant flowers.

C. Newelli (Syn. Habrothamnus Newelli), flowers bright crimson, produced in dense clusters. Flowers large.

C. Corymbosum, flowers red, produced in dense panicles, which are terminal. *(Syn. Habrothamnus corymbosum.)*

CHAMACLAEDON.

Nat, ord., Aroideæ.

C. Rubens. A handsome Aroid with leaves of about 4 to 6 inches long, 2 to 3 inches broad, ovate, dotted over the upper surface with small scales, and of a red colour beneath. This is grown in loam, sand, leaf-mould, crock and mortar in the grass conservatory. Propagated by division.

CHAMAEDOREA —*(Palms.)*

Nat. ord., Palmaceæ.

Very handsome palms, chiefly natives of South America and Mexico; there are several varieties that might be grown successfully in this country. They are mostly all slender dwarf species and very beautiful. *C. Arenbergiana, C. Desmoncoioides* (climbing habit after growing 6 feet), *C. Elegans, C. Ernesti Augusti, C. Formosa, C. Graminifolia, C. Geonomiformis, C Microphylla, C. Sartorii, C. Wendlandi.*

CHAMAEPUCE.—*(Thistles.)*

Nat. ord., Compositæ.

C. Casabone, ornamental as single specimens on a lawn. Height 2 to 3 feet. *C. Diacantha*, massive variegated foliage plant. Leaves lined with silver markings. Height 2 to 3 feet. *C. Stricta*, flowers purple, leaves veined white. Height 2 feet. They are propagated by seed, sown at the same time as annuals, in October in the plains, and in October and March in the hills.

CHAMAEROPS.—*(Palmaceæ.)*

Chamærops are handsome plants of the palm genus, which derive their name from their being dwarf or near the ground, and *rhops*, a bush. *C. Maratima, C. Humilis, C. Macrocarpa, C. Fortunei.* These are propagated by offsets or by seed. These palms are best grown in strong loam, a little sand, and leaf-mould.

CHAMERANTHEMUM.

Nat. ord., Acanthaceæ.

C. Beyrichii Variegatum. A plant of comparatively new introduction, not yet generally known in this country. A small shrub with variegated leaves with a greyish band in the centre. A garden variety, propagated by cuttings during the rains. *C. Pictum :* the leaves are green bordered with orange, and with irregular silver blotches. The young leaves are covered with orange colored hair.

CHEIRANTHUS.—*(Wall flower. Perennial : sweet-scented.)*

Nat. ord., Cruciferæ.

Of the wall flower there are many varieties now in cultivation, and great interest is taken in growing them from seed, on account of their producing different varieties. From their being sweet-scented, they are great favourites. Their seeds should be sown in pots, in the plains, in September and October, and in hill-stations, either at that time or in spring. These plants are grown to perfection in the hills especially. They withstand the winter and flower in spring most luxuriantly. Adjoining are a few varieties of good sorts:—Feltham Blood Red is a new and fine variety of very large size and deep coloring :—

Wallflower—German, double	...	2 feet.	
Finest mixed, double	...	1½ ,,	
Chameleon, single	...	1½ ,,	
Dark, fine single	...	1½ ,,	
Purple, single	...	1½ ,,	very handsome.
Yellow, single	...	1½ ,,	
Mixed, single	...	1½ ,,	

When strong, prick out and plant in beds well drained. There is now an annual variety which is most suitable to the plains.

CHIMONANTHUS.

Nat. ord., Calycanthaceæ.

C. Fragrans. Rather an unornamental shrub, bearing fragrant yellow flowers which are purple within. Mainly grown

for the exquisite scent of its flowers. Leaves lanceolate pointed and slightly hairy beneath. *C.f. Grandiflorus* bears larger flowers. Propagated by layers.

CHINODOXA.—*(Glory of the Snows, for the hills only.)*

Nat. ord., Liliaceæ.

A small bulbous plant suitable to hill gardens. Plant the bulbs in October in pots in light soil, and do not divide the bulbs. They flower better in this way, and do best under a hand-glass or frame. Propagated by division or seed. It is best however to get bulbs.

They have lovely blue flowers. *C. Eretica*, white or pale blue. *C. Forbecii* or *Luciliæ*, entirely blue shading to white towards the centre. About one inch in diameter.

C. Nana, lilac and white, in many flowered umbels.

CHORIZEMA.

Nat. ord., Leguminosæ.

Pretty plants which grow to about four feet in height. Trained on a trellis or grown in bush form. They should be potted firmly in a soil made to resemble peat with a little sand intermixed. These plants are best suited to the hills, where they should be grown under glass, protected from rain, as they cannot stand excess of moisture. *C. Augustifolium* bears orange red flowers in terminal many flowered racemes. *C. Cordatum*, red or yellow flowers. *C. Henchmannii*, scarlet flowers. *C. Varium*, yellow, red. They are best propagated from seed.

CHRYSANTHEMUM.—*(Annual Varieties.)*

Nat. ord., Compositæ.

The annual varieties of Chrysanthemum are very showy and quite indispensable among the annual flowers sown in our Indian gardens.

Chrysanthemum Carinatum or Tricotor, of which there are many varieties, all of which are of most easy cultivation.

The seed should be sown early in October in the plains, and in February to about the middle of May in the hills, but those sown late are liable to be spoilt by rain before they flower. The seed should be sown in pots or boxes if sown early, and then planted out as soon as strong enough to handle and to bear the sun. They will require to be shaded for a few days after transplanting. It is best to plant them in a good rich soil with a good deal of leaf-mould.

Tricolor Album, white with a yellow centre.

Atrococcinium, crimson scarlet.

Burroidgeanum, white, crimson and yellow, very pretty.

Carinatum, white and yellow.

Eclipse, very large flowers, 2 to 2½ inches in diameter, golden yellow with a ring of purplish scarlet and disc of dark brown. Very handsome.

Lord Beaconsfield, crimson with yellow centre. Good

Luteum, yellow.

Purple Queen or Atropurpureum, the darkest colored Chrysanthemum.

The Sultan, velvety crimson or maroon. Good

W. E. Gladstone, rich crimson.

Chrysanthemum, double annual hybrids.—A most unique novelty and very beautiful, sold in mixed colors—Bronze, Light Lilac Rose, Purple Prince, Picotee edged, Crimson Queen, Snowflake (white)—or sold in separate colors by the Himalayan Seed Stores, Mussoorie, N.-W. P. These are sometimes called *Larens double fringed.*

CHRYSANTHEMUM.—*(Perennial Varieties.)*

Nat. ord., Compositæ.

These may be grown from seed sown at the same time as the annual varieties, and grow into small bushes studded with flowers at almost all seasons, but is as easily grown from cuttings. They stand the winter of the hills and the heat

of the plains, if only protected slightly from sun and rain; for cultivation see annual varieties of Chrysanthemum.

C. Frutescens, "The French Marguerites," most valuable for cut flowers.

C. F. Comtesse de Chambord, large yellow.

C. F. Maximum Perfection, very large white flowers, about 4 to 5 inches in diameter, if well cultivated. Flower very soon after being sown, and produce fine bushy plants about 18 to 20 inches high. In the hills these plants require no protection, and with good cultivation produce more flowers on a like space than almost any flowering plant with such large blooms.

CHRYSANTHEMUM.—*(Perennial florists flowers, including Japanese Incurved, Recurved, Pompone, Anemone, and Early or Summer flowering, etc.)*

Among all popular florists' flowers, the Chrysanthemum stands preminently lasting in public favour: for many flowers have become fashionable and gone out of fashion, such as the Carnation, Fuchsia and Dahlia. Not so the Chrysanthemum, which seems to have come to stay.

It was introduced in or about the year 1790, when the flowers were considered ragged, miserable things, and it was only considered choice through, probably, its rarity.

In 1830, the first flower show when Chrysanthemums were exhibited, marks the date of its advancement and popularity. From that time onwards more novelties are shown now, and are sent out yearly, than there were varieties in those days.

Many florists of note have predicted that Chrysanthemums would die out in estimation, but they are more popular today than they were years ago, and seem to increase in value in the eyes of the horticulturalist and the public in general.

The extraordinary "craze" for this plant is probably due to its accommodating character and hardihood in almost any

climate, its great utility for exhibition, decoration and for cut flowers, during a season in cold climate especially when other flowers are scarce.

Its culture too is extremely simple, so far as to gain a moderate degree of excellence.

They are vigorous growing, free rooting and unprecedentedly free flowering, besides being readily propagated.

Their flowers are artistic and very varied in form and size—take for instance the Pompone, one inch or less in diameter to the huge Japanese, a foot or more across its bloom.

The Japanese varieties are undoubtedly the most æsthetic in coloring and fantastic in form, though the Incurved varieties run them very closely. The former are also most robust in constitution. The Incurved varieties used formerly to be perhaps more favoured than the Japanese, but are less so now.

The Chrysanthemum is not infrequently termed the Autumn Queen of Flowers, as the Rose is called the Summer Queen, and whereas the latter does not thrive in the smoke of town, the former may be seen grown in London in backyards and slums with the aid of the simplest contrivances, and they go on flowering there in the months of October, November and December. In India too they go on flowering for a long period, and as cut flowers stand in vases for a much longer time than almost, I may say with safety, any flowers.

With a shelter of cloth or canvas they may be protected from sun, rain and frost, and produce a crop of flowers of the best and finest kinds both in the plains and hills of this country.

It is indeed marvellous to say that all these splendid show flowers have descended from two species, *C. Indicum* and *C. Sineuse*. They are not quite hardy, especially in heavy, damp, clayey soils, which are cold.

The original varieties have a single row of guard petals and central mass of tubular florets of a greenish-yellow

color. These petals, by cultivation, have become multiplied to such a degree, that the flowers now are simply one mass of them, and are called double flowers.

The original flowers were golden, and thus their name was derived from "Chrysos" gold, and "Authos" a flower.

TYPES OF CHRYSANTHEMUM FLOWERS.

Our modern Chrysanthemums are now divided into several types, the chief of which are the *Japanese*, the *Incurved* and *Reflexed*, which are those which take the largest place in exhibitions and shows. Then come the Pompone, the large Anemone flowered, the small Anemone flowered, or Anemone Pompone; and the early or summer flowering class, which now seem to be "catching on" or taking a place in public favour.

Now there is also a type which seems to be taking a place in the estimation of the people, called the single Chrysanthemum, which in form of flower is like the Paris Daisy or Chrysanthemum Frutescens, but the colors are various. They keep in flower over a long time, and the flowers are of good substance.

I may add the Plumed or Hairy Chrysanthemums, which are of the large Japanese form, but the petals on the reverse or outer side are covered with a hairy pubesence, and the Boutonnière or Spidery variety, which are very curious indeed. The petals are sometimes pointed and twisted like that of a Cactus Dahlia, at other times quite flat and very pointed, sometimes tubular and divided at the ends.

SOME GENERAL REMARKS.

The Chrysanthemums above mentioned can all be grown in the hills to very considerable perfection in the open ground, but in the plains they are liable to be very much injured by the great heat before the monsoons set in, and are therefore much better grown in pots, and better still if the pots are kept in a plant house. The Pompone varieties and small Anemone flowered Chrysanthemums should not be disbudded

or have their buds taken like that of the Japanese and Incurved types. The Boutonnière and single flowered varieties are better off, only having some buds thinned off slightly; Chrysanthemums grown in the ground should be treated in just the same manner as those grown in pots.

No fixed and exact time can be given for the putting down of cuttings, or for taking off buds, applicable to the length or breadth of India.

This will appear obvious to the intelligent reader. To those living in the plains, I strongly recommend the cultivation of Chrysanthemums in pots, if perfection is desired. Not to say that you cannot grow them in the beds of your gardens, but that you will not obtain the same fine results, though, to be sure, you will have heaps of flowers to fill your vases with; to make a great display of flowers in your garden, and have masses of color.

But if you want to have a choice show of flowers of the best type, grow them in pots.

Mr. Molyneaux, lecturing on Chrysanthemums (and there is no better authority than he), warned beginners as to their selection of varieties; especially new ones, and new firms recommending so many fresh kinds that we never hear of afterwards. "All should be on the alert, choosing those who are careful in selection and in supplying meritorious varieties." And I would say, even then select standard varieties, unless you have the facility of growing *hundreds* of varieties well. Catalogues are full of varieties, many of which are so like others as to be hardly distinguishable. "Seed is now saved in every country in the world," writes Mr. H. Cannell, who is a careful horticulturalist and seedsman.

It comes up readily, and of course each raiser sees wonderful things in his own, so they are thrust on the public. "From long experience seedlings want careful selecting with practical knowledge, and even then should be well grown and shown the following year, as there may be many little nasty

habits to prevent them ever becoming popular." These are ust the plants you have to avoid, and there are many of them hrust on the public.

Mr. C. G. Ollenback, Dehra Dun, has a choice selection of Chrysanthemums. I may say all his are standard varieties, and many of the best new varieties which have been tried.

Exportation of Chrysanthemums.

If you get your plants from England, or in other words import them, I strongly recommend Messrs. H. Cannell & Sons, Swanley, Kent, and Messrs. Dobbie & Co., Rothesay, Scotland: they are well known firms who are well acquainted with the packing of plants, etc., for exportation, and there is no danger of your suffering loss. It is always better to get plants from dealers who are exporters, for not one out of a hundred dealers and nurserymen know how to pack plants for exportation or how to prepare them for it. These firms I have mentioned are quite as cheap as any in their prices, and much cheaper when it is taken into consideration that you may depend on receiving your plants in good condition. My object in writing these notes particularly on this subject is that so many complaints are made on this point (the packing of plants and bulbs for exportation). The paper "Indian Gardening" has had several articles re arding this point by correspondents mentioning firms' failures in this respect. If the public recognised the merits of known exporters, these complaints would not have occurred.

Another reason why I recommend Messrs. H. Cannell & Co. is they are a good firm *all round* for everything, and Chrysanthemums are *a speciality* with them. They raise and send out good varieties, and are the possessors of the best varieties; as well they know how to pack them for export. They are known all over the world.

The causes of failure in exportation are that people will obtain plants and bulbs from small firms, and firms that have little or nothing to do with exportation.

Leave your order with Messrs. H. Cannell & Sons, or Messrs. Dobbie & Co., and leave the packing to them. Do not try to advise them: they know better than you how to pack for export: and you will receive your plants in wonderfully good condition. When you receive your plants, open the package, take the plants out carefully, and put them in a tub of warm water for an hour or two—water that your hand can bear—and cover the tub with a double blanket to keep the water warm. Then plant them in pots not too large for the plants, and keep them in a room which is darkened more or less. Keep the floor and wall of the room sprinkled with water and keep the doors of the room closed all day and all night. As soon as the plants show signs of growth, expose them to light gradually and then remove into the shade in the open, after that to partial sun. The best time to get Chrysanthemums is during the cold season—December, January and February—that is, to import them.

The General Treatment of Chrysanthemums.

Chrysanthemums are so generally grown now that I think it justifiable to write particularly and at length of their culture, beginning with cuttings, after they have done flowering in the hills: in the plains, take up the roots in January or February. By cuttings, I must clearly explain I mean cuttings of the roots; nothing else must be used for propagation (unless under special circumstances, such as when a sport takes place and it is intended to propagate the sport). Stem cuttings always have, during the first season at least, the tendency to start flowering out of season, which means the flowers will be very poor.

The cuttings must be of the thick roots, with the fibres or rootlets (which are brownish or whitish and thread-like) cut off.

Shake out the compost from the roots and wash them clean of the remaining earth. With a sharp knife cut the roots into pieces, 2 to 3 inches long, each (not reckoning the

leaves) with a tip on each cutting of leaves. Plant each of these in a 2-inch pot in the following compost.

Perhaps the best description of compost is turf, or what you can just cut off with a hoe from some waste land, three to four inches of the surface soil only: stack this for two or three months, or till the grass is dead. Chop this up when in a dry condition so as to lose neither the dust nor fibre. Add about the same quantity of leaf mould of the best quality, free from worms, ¼th of the whole amount now should be added of silver sand and just a little soot. Mix the whole well. But yet a little improvement may be suggested (and that is what some of the most successful cultivators of Chrysanthemums use). The leaf stalk of your Chrysanthemums should be kept, instead of being thrown away; these should be dried and burnt in a heap for their ashes. It contains the inorganic constituents of the plant. Add a quart of their ashes (or failing this, ordinary wood ashes) to every 37 seers of compost, and mix well. In this compost plant the cuttings in thumb-sized pots and plunge the pots into soil or ashes up to their rim, and shade from sun with mats; after that give a good watering once; *then* when watering is necessary again, water the leaves more than the roots.

When the plants are rooted, they should be shifted for the first time in the same compost as above, but enriched. This time you should have had your turfs cut, as advised above, two or three months beforehand, and as you stack them, turn the grass side downwards, and between each layer of turfs, lay 2 inches of fresh stable manure. In this way the nutriment permeates the soil; and the manure remains sweet and wholesome food for the plants. Chop this stack down when necessary from one side, and it will form good material for the foundation of all later pottings. For the first shift add to this material one-third good leaf mould, one-fifth or one-eighth part of sand according to whether the turf soil you use is light or stiff (less sand if it be light,

and more if it be stiff turf soil), a dash of soot and wood ashes, or, better still, of the ashes of Chrysanthemum stems. Tap your pots gently and remove the plants with the ball of earth intact, and place it in a 3½-inch pot, and round the ball fill in the space with the above mentioned compost, first having placed some drainage in the pot.

No further shift is necessary in either the hills or plains till the middle of April to the beginning of May, or middle of June, according to the strength of your plants. If your plants are strong, they require to be repotted at the earlier time mentioned; if weaker, their roots have not filled the pots and they may remain longer, even to the beginning of June. Before the final shift to the flowering pots, you must judge by the strength of your plant if you will retain one or two or even three shoots, and all the remainder must be cut off, and I would recommend this to be done a few days before or after the final potting; that is, if you want large flowers for exhibition and not decorative specimens. One or two shoots is in such case the best and safest medium to strike; three *may* be too many, unless your plant is very vigorous.

Use from 7 to 10-inch pots in diameter for final potting according to the variety grown. For this final potting employ the same turfs cut in the second potting and add the same amounts of leaf mould, sand, and ashes as recommended above, but add to it a 5-inch pot-full of Thomson's vine manure, or a 6-inch pot-full of Dobbie's Fertilizer, or half that quantity of Ichthemic Guano, and a pound of bone meal to what would be three large baskets full.

This should not be too wet, and must be rammed down firmly in potting. Syringe the plants several times daily, but do not water much, if at all, or the soil will be soured. In transplanting, care should be taken that the roots of the plants are in no way injured.

The roots of the plants will begin to move in the new soil, and then watering must be carefully done, and all during

summer, and in fact till the blooming period has been completed, the plants *must not be allowed to want for water.* In their blooming pots the buds of the plants will appear at various times extensively over two months, and if large blooms are required, no pinching or stopping is necessary. The plants, as soon as the buds appear, must be watered with weak liquid manure weekly. The buds must, as soon as they appear, be "taken," as the term is, that is, every shoot or bud surrounding the centre one must be removed, cut off with a sharp knife. The leading and only shoot (or two according to the strength of the plant) must now be carefully tied up to a wire stretched between two posts, the pots all being put in a row under the wire between the two posts. If you are not going to exhibit, I would advise your keeping two buds on each of the one or two shoots you retain on your plants, that is, if you do not want enormous blooms. Your plants will not on the plains be able to stand the full blaze of the sun's rays on them. A grass conservatory with a thin roofing or "*chicks*" placed as a roofing will be sufficient protection from the direct rays of the sun.

DECORATIVE CHRYSANTHEMUMS.

For decorative purposes, shoots will not require thinning to such a great extent. To make specimen plants for this purpose, take those that have flowered the year before, only pinching out the thin shoots, and when long enough, pinch the tops of those left on the plant. About 30 to 40 shoots would make a really fine specimen. The shoots should be carefully tied out to stakes in the pot, admitting all light and air possible to the centre of the plant. Disbud to one bud on a shoot, and treat generously, as for Show Chrysanthemums in their flowering pots.

General Treatment for Show and Decorative Chrysanthemums.

In the hills do not expose your plants till the chances of frost are over. Frost will not kill your plants, but in other

ways harm them. The leaves get nipped, and also the fine fibrous rootlets; and this is harmful.

If at any time the foliage looks yellow, a very little soot, dissolved in water, does good immediately. Tie the soot within a rag and tie the same to a brick to sink it in water, and the water will be soon impregnated with the soot if you move it about in the water. This liquid manure acts like a charm in such cases, and the foliage soon gains a dark and vigorous hue.

In placing your pots in rows, place them due north and south in lines, and both sides of the plants will have a fair share of the sun through the chick or grass roofing. Have each row of pots not less than five feet apart, though they may stand quite close to each other in the rows When your plants make their first "break," there will be, as a rule, three stems to support, instead of one, and of these, the outer ones are tied to sticks on the outside of the one first placed to support the main stem. The three stems are thus trained out flat, equidistant from their neighbours. Bamboos make the best sticks. There should be two, three or more tyings along the stems to make the plants safe against storms.

WATERING AND FEEDING.

Water must be given at all times, as necessary; that is as often as the soil is moderately dry, but not before that, and then care should be taken that *all* the soil in the pot has been thoroughly wet, and the water has come through the drainage-hole.

More water than this is not necessary, as with the overflow through the drainage is carried the manure, which it is necessary to retain: feeding with liquid or solid manure is an important point. Do not begin supplying liquid manure till the pots are full of roots and the plants are becoming pot-bound. Give the liquid manure weak and often. (I am no advocate for the use of solid manure as surface dressing for

Chrysanthemums, especially at this stage.) Do not apply it strong, especially at first, but go on increasing the strength until the flower buds are fully developed; then as they begin to show color, gradually discontinue the stimulants and use pure water only by the time the flowers have fully expanded.

For Chrysanthemums sheep's dropping, dried for a few days, 32 seers to 40 gallons of water, is a very good liquid manure. Let it remain for two days, then stir and use it, at first adding a little water to this strength to weaken it. Horse dung, first dried and used in the same proportions, is nearly as good. Half to one ounce of Ichthemic guano to a gallon of water used as a liquid manure *occasionally* is very good, but, being of a burning nature, must be only used seldom, for it is quick in its action and very powerful. Nitrate of soda and sulphate of ammonia, two highly stimulating salts, containing much nitrogen, are exceedingly useful.

NITRATE OF SODA is very quick in its action, and at once promotes luxuriant growth, and a deep green to the foliage and size is added to foliage as well, but if applied too frequently it renders the growth too sappy and soft. In backward plants it may be given with the best results, and also in hot weather. The proportion it should be used in is ¼ to ½ oz. to each gallon of water, and then not oftener than three or four times during the whole season.

SULPHATE OF AMMONIA should be used to act directly on the buds, assisting the development of the flowers. It imparts to them size, finish, and color. Then, given in small quantities, it is of highly valuable aid to the cultivator at the stage when the buds have formed, and it is to some extent a help to growth as well, and encourages root action in a rapid and remarkable manner, but excess must be most carefully avoided.

Use it in the same strength as the nitrate of soda, that is ¼ to ½ oz. to a gallon of water, and then use this when the buds first appear, and onwards every ten days, till the flowers begin to show color. Neither of these salts or guano should

be used in a dry state, as they are sure to burn the surface roots (there is no surer way of doing harm).

Top-dressing in England is sometimes recommended in August by some writers, who are gardeners, but the most successful prize winners actually call it injurious; because such portion of the soil being occupied by roots at first, the top soil appears sufficiently moist when the soil below may be dry, and errors in watering result, and the upper surface roots are burnt by the manure.

If any surface dressing be given, let it be a little fine loam and burnt earth, lime, and some good fertiliser.

It is always necessary that liquid manures be used at least before the stage of development of the buds takes place, or they will not set well. Many of them will be deformed, crippled, or fall off, if it is not used. It should always be given especially a week or so even before the buds appear, and especially at that time the Sulphate of Ammonia. When the plants are pot-bound, liquid manure may be safely administered; but the excessive or strong use of liquid manure makes the flowers wanting in depth and fullness.

"BREAKS AND TAKING OF BUDS"

The first "break" or forking of the branches takes place sometimes when the first flower bud appears, and then three or more lateral shoots are sent out. If these incipient shoots are cut or pinched out, the strength of the plant is thrown into the buds, which then swell and expand into flowers. Chrysanthemums vary, some making two and others three breaks, that is, if the bud be cut out, the buds then being so formed are termed "crown" buds, but towards the end of the season of final growths from the last "break" do not run far and develop; not one single bud, but quite a cluster of buds form round and below the farthest or central one, which is called "the terminal bud," for after this formation the plant makes no more growth above, but at

its base during that season. Some few varieties, however, make several growths before the final crown bud and terminal growths appear.

The operation of "taking the buds" means that you secure or retain them by removing those you consider incipient growths and buds below or round about them.

There is no doubt whatever that far the greater number of exhibition flowers of Japanese, Incurved and Reflexed are obtained from crown buds. As a general rule the crown bud produces flowers not only larger than the terminal bud, but they possess greater depth and solidity. But to this rule, as to all rules, there are exceptions, with some varieties of Chrysanthemums, and these you will often see named in catalogues. I need only mention Anna Hartshorn, Elaine and Mlle. Lacroix as among the number; because, if they were grown the ordinary way and the crown bud taken, they would be far too early. Then, again, some of the extra vigorous varieties, among which are classed Etoile de Lyon, Condor, G. Daniels and others, produce far more refined blooms if grown from the terminal bud.

If grown from crown buds the flowers are coarse and the color inferior. The proper time for taking buds leads you to the subject so all-important to those who exhibit Chrysanthemums, namely, to timing the flowers.

In removing or cutting out the buds you decide to dispense with, you must not be in a hurry, and cut them and such growths as you wish to remove, all at once. Remove a few buds and growths at a time one day, and then the following day, or day after, a few more, so as not to stop or check the flow of sap.

The routine of the "large blossom" system then is something like what the following remarks will show (with a few exceptions of course in the growing of early varieties).

The plants are not stopped, and grow on with a single stem till the first "break" occurs, when the bud then formed

is removed, and, as a rule, the three shoots that succeed it are retained and tied to sticks as they extend. Should another break occur before the beginning of August, this bud must be removed, and the plant be allowed to grow again, but this time only allow one growth to proceed from below each bud, so as to keep the number of shoots the same as before.

August is too early for any buds for November shows, and if this bud that now appears is removed, it will be followed by a terminal one, but this will produce much smaller flowers, and probably would be as much too late as the other would have been too early: so on the whole, especially if the variety be one that takes a long time to develop its flowers, it would be better to retain than to sacrifice it, as the flowers can easily be retarded to some extent. The "crown" bud formed at the second "break" is, however, the one that generally produces the "show" flower, and this must, therefore, be "taken" by nipping off all growths formed below it, as soon as they can be got hold of. If these had been allowed to remain, they would have formed the "terminal" buds, but these, as already stated, are seldom made use of, so as a rule they are removed, and the formation should be prevented.

By keeping your plants cooler you can retard considerably, and shading will help you in this matter.

TIMING THE FLOWERS.

As one of the best authorities on Chrysanthemums writes:—"This is undoubtedly the 'crux' of the Chrysanthemum exhibitor, the point in which experience and skill tell most." Of this little is known in this country, where Chrysanthemum shows are few and far between.

Growing is a routine merely, but your flowers, however fine they be, are useless if not in perfection by the date of the show. A thoroughly "even" stand will always be placed before one, with some large flowers and others comparatively small, imperfectly developed or past their best.

To gain perfection one must be acquainted with each variety and its peculiarities.

The buds that appear on the majority of the Japanese varieties by about the 1st September may be taken about the 18th of that month for a November show. Much has to be learnt on this point of timing in India, for there is no doubt that climate makes some very considerable difference, as well as the fact that some varieties will develop much sooner than others, and this depends on the treatment of your plants, your experience of the varieties grown, and your skill. As a rule, no buds of Incurved varieties are taken before the 10th September for November shows at the earliest. In the plains the Chrysanthemum shows will be much later and time different. Always bear in mind that in all cases flowers from early buds, though large, are comparatively coarse in appearance: and those from late ones refined in form, better in colour, though smaller. Retarding, remember, may be done by removing the plants to a cooler and airy place, by shading, by withholding stimulant liquid and other manures, by thinning out the buds or growths slowly and gradually, taking longer to do so, instead of all at once. Their development may be hastened by removing to a warmer situation and full sunshine, by the application of stimulating liquid manure, particularly sulphate of ammonia, and by severe thinning of the buds.

When it is desired to bring a flower up "to time," the earlier stopping or cutting back is done the better. The time for taking buds, I must remark here, is one you will have to gain a knowledge of through experience of the climate you grow your plants in, and that is so various through the length and breadth of India, in the hills and plains.

AFTER FLOWERING OR HOUSING, SHOULD FROST SET IN.

Your plants must be housed if they have done flowering or not, if frost sets in, for though they will stand much frost

and not die, their flowers, if they are flowering, will be injured. If they have done flowering, their rootlets and leaves will be injured, and the plant weakened under any circumstances if there be frost. The Japanese varieties stand a higher degree of temperature than the Incurved, and a less degree of cold.

DAMPING.

This is less likely to occur in India than in England, and the higher the culture and the larger the flowers the more likely will it occur. It is indicated by small spots on the petals, which go on increasing gradually till the whole flower is involved and rots away. It is caused by a stuffy, too moist atmosphere, too little ventilation, over-feeding and unripe wood. Damping (or rather rotting I would call it) caused by the drip off a badly constructed glass conservatory is a totally different thing and easily avoided. Tin or wood nailed over the leaky spots diverts the water at least to some other spot where it is harmless. This applies to plants grown in conservatories.

Another sort of what is called Damping is a kind of rust, caused in the same way as mildew, by chill or draughts of air. Well ripened wood, cautious feeding, a watertight roof, and airy but not draughty atmosphere, careful watering, especially in the forenoon, and a moderate amount of sun, are effectual preventatives for all these infections. Sometimes Chrysanthemums lose their lower leaves, which first get black spots on them, and then wither. This is chiefly caused by the soil being too clayey and not friable, and also from bad drainage when the plants are grown in pots.

CUTTING, DRESSING & STAGING FLOWERS.

Don't cut your flowers till the day of the show. In England it is generally done the day before the show; we cannot do so here. If a flower is fully expanded a few days before it is wanted, remove the plant to a cool, moderately dry shed or room, and it will make no progress for some time. In cutting,

use a sharp knife and slit up the stem for an inch or more, and put it in water in which there is a pinch of ammonia or salt.

Dress your flowers some time (even a day) before you cut them, though you will of course have to dress them a little again when put in position. A week or more before the show, pull out stray and crooked petals with the tweezers for the purpose, and train others in the way they should go. Sometimes, not often, a yellow or green eye will show: this must be hidden by pulling some of the nearest petals over it, both in the Japanese and Incurved varieties.

When you are doing all this, remember, when you are selecting the flowers for exhibition, that a solid compact build and high finish with good color will often count for as much at least or more than for size only, and the more even your stand is the better.

To get the most perfect Incurved some growers recommend that when 8 or 9 inches of the stem is left free, the flowers by their own weight will hang their heads downward, and develop the most perfect flowers. After Japanese flowers have travelled in a box, a thorough and gentle shaking with their heads down will not unfrequently arrange the petals as well or better than anything else, and just a touch or two here and there, when the blossoms are placed on the board, will suffice.

The size of the box, according to regulation, for 12 blossoms is two feet by eighteen inches: when showing for 24 or 28 blossoms, two and four boxes respectively are placed side by side. This is large enough for Incurved and Reflexed flowers, but too small for Japanese now produced, and 6 inches larger each way, or 6 inches one way and 4 the other, would be better; but exhibitors must adhere to the rules, or be disqualified.

Proper tubes must be got, or you may make them, but you must adhere to the proper measurements. The flowers in the back row should be, say, 2½ inches high from the board,

those in the front row 1 ½ inches. The largest flowers should be in the back row, but in these days all must be "largest." Artistic taste must be displayed in arrangement of color; generally the darkest hues are placed at the back: but artistic feeling must be displayed.

In judging, size counts greatly, especially in conjunction with depth and solidity. "Finish" or neat appearance, which is due a great deal to careful dressing, especially in the Incurved class, tells largely; and freshness and color are indispensable. Your flowers must be true to name, written on slips of cards in a bold round hand, to be easily read by every one, and be clear of the flower, so that they will not require to be handled, which would never do, or the petals of the flower would be pulled about: so it is better to fix the cards on wire supports.

You have done your best: wait, win, or lose.

Single and Pompone Chrysanthemums.

These varieties do not require disbudding or such heavy feeding as the large flowered kinds.

They make fine plants for the decoration of verandahs, conservatories, rooms and tables.

Early Flowering Varieties.

These have become very popular in England and on the Continent, and in India require, as soon as the rainy season comes on, to be planted in good rich garden soil, well manured.

When the plants have got a good start, they must be staked to prevent them being blown down by the wind, broken and damaged. These should not be disbudded or pinched, as they bear their flowers earlier, producing beautiful sprays for cutting when allowed to grow quite at their own sweet will. As early as October, or even the close of September, some of them will be at their best in hill-stations. If a shade can be put over them, they will well repay the trouble, and the flowers will be finer and last longer. Such shade as a

"chick" can afford, just the sort you hang to shade your verandah, but without any cloth lining. Liquid manure benefits them when in bud.

Liquid manure useful when Chrysanthemums are in bud.

Sulphate of Ammonia will be found useful, mixed in water, when the plants seem to be growing weakly, or not quite as strongly as they should, when in their flowering pots. It is especially useful when the plants are in bud, and assists them to swell the buds, and give vigour to the whole plant.

Unless you wish to save seed from your Chrysanthemums, I would advise you to cut off the flowers as they fade, as it is an unnecessary strain on your plants. Growing Chrysanthemums from seed I would leave to the professional gardener, as it requires very considerable experience and space. Out of many seedlings an exceedingly small percentage are of any good, and these too after a year or two will have to be again selected from, as many of them have certain objectionable habits of growth or of flower, for which they have to be discarded.

Below are some of the best new Japanese varieties of 1898 with Messrs. Cannell and Sons' descriptions abbreviated. Japanese Chrysanthemums stand heat better than the Incurved varieties. I therefore recommend them for growing in the plains.

New Japanese, 1898 and 1899, of Messrs. H. Cannell and Sons' own raising.

C. F. PAYNE. The ground color is yellow, heavily dusted and striped red.

KATHLEEN ROGERS. White, slightly creamy centre. Very fine.

DUNCAN MCHUTCHISON. A sport from Lizzie Cartledge, more robust than its parent: petals longer and broader: color a warm and pleasing shade of rosy salmon, centre finishing off to a pure golden yellow.

Miss Maud Cassels. Bright red, old gold reverse.

Mrs. C. E. Wilkins. Distinct and effective. Flowers deep and full, florets very long and of a lovely tint of silvery mauve.

Mr. W. C. F. Gillam. Of a rosy salmon on a red ground. Very good.

King of Portugal. Grand flowers. Very long and broad petals, forming beautiful exhibition flowers: rich chestnut red with a brighter reverse.

Mrs. Ernest Cannell. A most unique flower of grand proportions, full and remarkably deep; color silvery lilac with brighter reverse. A splendid exhibition variety.

Mrs. N. Fokes. A pure white flower with long florets. Award of Merit, Royal Horticultural Society.

Queen of Portugal. Exceptionally broad petals and very long, color being beautiful creamy white, passing to pure white. A grand variety for competition.

Australian and New Zealand varieties, 1898-1899, sent out by Messrs. Cannell and Sons.

Chatsworth (Japanese). Rosy white, evenly striped, silvery white reverse. Long and irregularly formed flowers, very large and full centre.

Wonderful. Like Mrs. Wheeler, but much broader petals, and a fuller flower.

Egmont (Japanese). Brightest red, nearest approach to scarlet. Reddish or orange-yellow reverse, like E. Molyneux, but brighter and more double.

Walleroo Fair Maid of Adelaide. Pure white (Japanese). Slightly twisted petals.

Glen Eira (Japanese). Immense size. Rosy lilac. Reverse lighter.

John Pockett. Indian red, gold reverse. One of the best Chrysanthemums sent out. Won V.C.S., F.C.C. Mabel Kerslake. Immense size. Bright crimson. Reverse shaded

old gold. (This is an Incurved Japanese). Miss Vera May Frazer. A shade of terra-cotta. Reverse lighter. Miss Mary Underhay (Incurved Japanese). Golden yellow. Miss Nellie Pockett. Creamy white, long drooping florets. Won V.C.S., F.C.C. Mrs. C. Bown. Long drooping florets. Won V.C.S., F.C.C. Mrs. Ernest Carter (Jap.) V.M.C. Mrs. H. B. Higgins (Jap.) V.M.C. Mrs. J. Allard. Mrs. W. G. Beath (Inc. Jap.) Pride of Stokell. A fine variety. Sport from Pride of Madford. Chestnut, lined and tipped gold. V.C.S., F.C.C. Purple Emperor(Japanese). The Convention. Salmon red. Bright buff reverse. V.C.S., F.C.C.

New Varieties by Various Raisers, 1898.

Admiral Ito. Soft yellow. Award of merit (R. H. S.) Royal Horticultural Society. Baron Reicher (Jap. Inc.) Apricot yellow, of the largest size. Don de la Madone. New and curious color. Very late flowering. Purest white, sea green centre. Recommended by the National Chrysanthemum Society (N. C. S.) Geo. Gover. Lovely rose. Joseph Chamberlain. Glowing crimson, golden reverse; a fine and magnificent novelty. Lady Broughton (Jap.) Immense blush white. Mary Molyneux (Jap.) F.C.C., National R. H. S., Bristol, Hull, Winchester, Southampton, Portsmouth, and silver medal, National Show, 9th November, 1897. A record. Blooms immense. Lovely shade rosy-peach. Mrs. Arthur Goodrich. Immense. Rose, silver reverse. Mrs. Chas. Birch. F.C.C., N.C.S. Mrs. G. A. Haines. A glorious color, eclipsing Col. W. B. Smith, but not an Exhibition variety. Mrs. J. Ritson (white Viviand Morel). This in itself speaks, for there are few to equal or beat that fine old variety. Silver medal, Scottish Horticultural Society, Edinburgh, November 1897. Mrs. W. Mease (Sulphur Madame Carnot). Winner of high merit, N. C. S. Owen's Memorial (Jap.) A grand novelty, blooms measuring one foot across florets, broad and drooping. Crimson red, gold reverse. Mrs. White Popham. A lovely color, white, lined and frosted carmine.

COUNTESS GREY, purest white, slightly drooping and incurving petals, very massive. CHAS. WILSON, deep crimson, flat florets, has a striking appearance; and many others which are equally good.

New Incurved, 1898. Various Raisers.

MRS. A. E. STUBBS, bright golden yellow, as large as Chas. Curtis, but deeper color. MRS. N. MOLYNEUX, incurved of truest description, and one of the largest in cultivation; ivory white. F.C.C., N.C.S., and many other awards. MRS. SARAH OWEN, reddish bronze, tipped golden bronze. COUNTESS OF WARWICK, enormous flower, soft rose, pale flesh at base of florets; the finest introduction of the year.

Cannell's New Decorative Japanese for 1898 & 1899.

LADY ONSLOW, a spidery shaped flower of beautiful lemon yellow, narrow petals, forming a perfect ball. MISS HARVEY, pink at first, changing to white; very pretty.

Cannell's New Singles, 1898.

BLANCHE CHAPMAN,—Mary Anderson enjoyed a high reputation owing to its good qualities: this is quite as good. Flowers single, silvery rose; plant forming a good bush. CANNELL'S GEM, rosy amaranth. FREDA, large flowers, deep pink; plant bushy. MADGE, golden yellow. KING OF SIAM, the finest crimson single yet introduced. POINSETTIA, large single decorative variety; Indian red, nearest approach to scarlet; flowers 7 to 8 inches in diameter. Disbud to terminal flowers only. Plant in 6-inch pots. MRS. W. BIRD, large single, velvety red, lighter reverse; very good. CHESTNUT QUEEN, chestnut color, large single, dwarf. BEAUTY of BELFAST, flesh color—a beauty; a dwarf of bushy habit.

Large Anemone Flowered, 1898, and good older Varieties.

MRS. P. R. DUNN, pure white guard petals and disk, dwarf. MRS. VIRGIN EARLE, silvery pink, large, high and well formed; lovely. CÆSAR, rose, tipped yellow; F.C.C. EMPRESS, lilac. FLEUR DE MARIE, white. GEORGE SAND, red, with bronze centre. GLUCK, golden yellow. JOHN BUNYAN, lemon yellow.

Grand New Early Japanese Varieties.

ALBERT ROSE, rose. DORIS PETS, pure white. MRS. DOVE ELLIOTT, pure yellow. MISS MARTIN, pink, fading to white. MRS. GEO. HILL, primrose, deeper in the centre. MRS. SQUIRE, white. PRIDE OF MITCHETT, pink, gold centre.

Continental Novelties, 1897.

BEAUTY GRENOBLOISE (Inc. Jap.), huge creamy white. CZARINA (Jap.), very large, pale lilac, tipped rose, long petals. HENRI YVON, rosy salmon on yellow ground. ISERETTE (Jap.), brick red, pale yellow reverse, twisted petals. MADAME. A. BRUN (Jap.), immense white, tinted lilac, centre pale yellow. MADAME EDMOND ROGER (Inc. Jap.), lemon yellow, shaded sea-green; unique color. MADAME G. BRUANT, enormous flower, light rose, margined deeper, reverse pink; N.C.S. award of merit. MADAME LOUIS REMY, pure white; a temptation to those looking for a monster, as this is a sport from Mrs. C. H. Payne. MAFRA (Jap.), very large, orange and yellow, shaded red. M. W. H. FOWLER (Jap.), very large, pale rose; N.C.S. JUBILEE (Inc. Jap.), very large, lavender, silver reverse; very large petals, incurved in centre. PRINCESSE DE GALLES (Jap.), immense, creamy white, tips yellow. SECRETAIRE FIERENS (Jap.), blood red, reverse golden. SOUVENIR DE MADAME F. ROSETTE, enormous, dark purple, reverse claret red.

Hairy Chrysanthemums.

BARONNE DE LA ROCHÈRE, large rose, reverse yellow. DUVET BLANC, pure white, with long hairs. DEUIL DU TZAR ALEXANDER III, purplish magenta, reverse silvery; fine color. EXPOSITION DE GUITRES, rosy mauve, marbled white, reverse silvery; very hairy. M. PIQUEMAL DE ROSEVILLE, enormous reddish flowers, magnificent. SAGHALIEN, bronze, reverse golden. ABBÈ PIERRE ARTHUR, pure white, incurved in centre, outer petals drooping. CAPT. L. CHAURE, yellow chamois, inside petals crimson. ENFANT DES DEUX MONDES (white Louis Bœhmer), white. HAIRY WONDER, reddish bronze, passing to golden bronze, one of the best. MADAME SECARECK, lavender, shaded rosy mauve. MIDNIGHT, very large, very dark color. VACANSON, like Louis Bœhmer, pink, but better.

Standard Older Varieties, Incurved.

ALFRED SALTER, pink. ANGELINA, gold amber. BARBARA, golden yellow. BARON BEUST, red chestnut. BEAUTY, delicate blush. BEVERLEY, white. BRONZE JARDINE DES PLANTES, bronze and yellow. CAMILLE FLAMMARION, rich violet; F.C.C. BONNIE DUNDEE, orange, shaded rosy bronze, reverse yellow; F.C.C. CHERUB, golden amber. DUCHESS OF FIFE, white, tinted rose, very large and fine. EMPRESS OF INDIA, white. ERNEST CANNELL, deep fawn; F.C.C., N.C.S. GENERAL BAINBRIGGE, orange amber, gold centre. GLOBE WHITE, white. GLORIA MUNDI, bright yellow. GOLDEN BEVERLEY, golden yellow. GOLDEN EAGLE, Indian red and gold. GOLDEN EMPRESS, primrose. GOLDEN JOHN SALTER, golden yellow. GOLDEN NUGGET, very fine, richest gold, blunt florets. GUERNSEY NUGGET, primrose. GOLDEN QUEEN OF ENGLAND, golden canary. HERO OF STOKE NEWINGTON, rosy blush, slightly shaded purple. JARDINE DES PLANTES, golden yellow. LADY CAREY, rose-lilac, with silver back. LADY DOROTHY, bronze, suffused gold; F.C.C. LE GRANDE, fawn. LORD DERBY, dark purple.

LORD ROSEBERY, silvery mauve, lined white. MISS VIOLET TOMLIN, purple violet. MISS M. A. HAGGAS, golden yellow. M. R. BAHAUNT, rosy purple. MR. BUNN, golden. MR. GLADSTONE, dark chestnut. MRS. DIXON, yellow. MRS. HEALE, creamy white. MRS. J. MITCHELL, golden amber; F. C. C., N. C. S. MRS. ROBINSON KING, golden yellow. MRS. S. COLEMAN, golden bronze, shaded rose, upper portion yellow; F.C.C. MRS. SHIPMAN, fawn. NOVELTY, blush. OWEN'S CRIMSON, crimson; F.C.C. QUEEN OF ENGLAND, blush. RENA DULA, rose, silvery reverse. ROBERT CANNELL, bronze red, under petals golden. ROBERT PETFIELD, silvery mauve; F.C.C. four times. ROSE OWEN, rose pink, edged white. SIR S. CAREY, brown chestnut, golden points. WHITE VENUS, white. WILLIAM TUNNINGTON, reddish chestnut, golden bronze tips.

Standard Reflexed Flowered.

AMY FURZE, lilac; F.C.C. ARIADNE, rose. CHRISTINE, peach. CHEVALIER DOMAGE, golden. DOCTOR SHARPE, magenta crimson, violet scented. EMPEROR OF CHINA, silver white. FELICITY, white, lemon centre. GAZELLE, crimson, tipped yellow. JEWESS, gold and red. JULIE LAGRAVERE, velvety crimson. MRS. FORSYTH, creamy white. PROGNE, amaranth, sweetly scented of violets. All these do very well as specimens for exhibition.

Large Flowering Anemone Chrysanthemums.

These are most unique and beautiful, like Pompon Anemones, but much larger. When exhibited, they should be in single flowers, like the Incurved, that is, with only one flower on each stem left on the plants.

ADA STRICKLAND, rich chestnut red. EMPRESS, lilac, very large. FLEUR DE MARIE, large white. GEO. SAND, red and bronze. GLÜCK, golden yellow. JOHN BUNYAN, lemon yellow, deeper centre. KING OF ANEMONES, large crimson purple. LADY MARGARET, double row of guard petals, white. LOUIS BONAMY, lilac. MADAME GODERAU, creamy white. MARGINATUM, lilac

blush, rose centre. MARGUERITE DE YORK, large sulphur yellow. MISS ANNIE LOWE, canary, deeper centre; F.C.C., N.C.S. MRS. M. RUSSELL, orange yellow; 2 F.C.C.'s. MRS. PETHERS, rosy lilac, large and beautiful. MRS. W. HOLMES, silver rose; F.C.C. PRINCE OF ANEMONES, lilac blush. PRINCESS LOUISE, rosy lilac. ST. MARGARET, brassy orange. SUNFLOWER, large sulphur yellow.

Anemone or Quilled Pompons.

These should be exhibited with 3 sprigs to a shoot, with 8 to 10 inches of stem and foliage. They require to be strengthened by wire, as their stems are weak and do not hold up their flowers well.

ANTONIUS, yellow. ASTREA, lilac blush. CALLIOPE, rich ruby red. DICK TURPIN, magenta, yellow centre. EUGINE LANJAULET, yellow, orange centre. FIREFLY, bright scarlet. JEANE HATCHETTE, white, yellow centre. GRACE DARLING, blush lilac. MADAME CHALONGE, blush. MADAME MONTELS, white, yellow centre. MADAME SENTIR, pure white. MARGUERITE DE COI, blush, pale yellow centre. MARGUERITE DE WALDEMAR, sulphur. MR. ASTIE, golden yellow. REGULUS, cinnamon. ZOBEDIE, light rose.

FIMBRIATED CHRYSANTHEMUMS are a hybrid Pompon section, the petals of which are distinctly scalloped. Space will not admit me giving a list of these; also the following—

POMPON VARIETIES, which have very well formed but very small flowers.

SPIDERY CHRYSANTHEMUMS are quite a new class. They are also called BOUTONNIÈRE and ÆSTHETIC. These are now taking the place of single flowered and Pompon varieties. They are decidedly refined and desirable in appearance, with no stiffness about them of form, and will no doubt occupy a similar position in Chrysanthemums as the Cactus-shaped kinds in Dahlias. They have good keeping qualities when cut for button holes, vases or sprays. Being new, I give a small list of the best to enable amateurs to select them.

Boutonnière, Æsthetic and Spidery Chrysanthemums.

ALICE CARTER, reddish brown, tipped gold; novel.

BOUQUETERRE, white, tipped yellow and gold.

CENTAUREA, deep orange yellow.

CHEVAUX D'OR, rich gold.

JITSUJETUI, silvery pink, very pretty.

MIDGET, smallest and most perfect form; innumerable flowers, color white, shaded pink; goes on flowering till very late in the season.

KING OF PLUMES, prettily cut and notched, rich yellow; award of merit, R. H. S.

MRS. FILKINS, golden yellow, prettily cut and notched; award of merit, R. H. S.

MRS. JAMES CARTER, pale yellow, passing to white.

SILK TWIST, rosy-mauve and cream, pretty.

WHITE ELKSHORN, pure white.

YELLOW SULTAN, golden yellow.

These require no disbudding or formal training, but only to have their branches tied up to prevent them being blown down. Good cultivation no doubt is necessary, but not too much manure.

Some Standard older Japanese Varieties.

ALICE SEWARD, rose purple, long broad florets. BEAUTÉ TOULOUSAINE, crimson, reverse golden, deeper color than E. Molyneux, gold much brighter. BEAUTY OF EXMOUTH, ivory white, curled and twisted petals. C. BLICK, golden yellow; F.C.C., N.C.S. CHAS. DAVIS, rosy bronze; a shade of color not seen in any other Chrysanthemum, being bright pink on rich golden yellow background. COMTE DE GERMINY, nankeen yellow. CROWN OF GOLD, peculiar form, brilliant golden. C. W. RICHARDSON, flowers 10 inches or more, yellow;

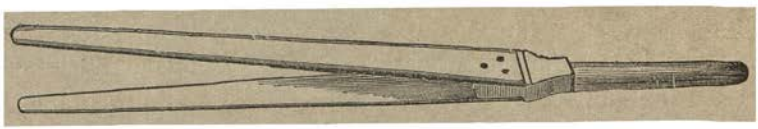
F.C.C. DUKE OF WELLINGTON (Jap. Inc.), enormous size, salmon buff, petals ¾ inch broad; 2 F.C.C.'s. DUKE OF YORK, deep pink; F.C.C. EDA PRASS, lilac. EDMUND BEVAN belongs to the class of E. Molyneux; golden bronze and chestnut. ELAINE, pure white. ELLA CURTIS, rich golden yellow, shaded light chestnut and bronze; F.C.C., N.C.S. ETHEL, pure white. FAIR MAID OF GUERNSEY, pure white. GENERAL ROBERTS, red, shaded carmine, large flowers. GEO. SEWARD, dark orange, softened by lines of reddish crimson, long drooping florets. GEO. W. CHILDS, dark velvety crimson. GLOIRE DE ROCHER, of the largest size, orange amber, flushed crimson. GOLDEN GATE, tawny yellow, certificates, Chicago F.C.C.; National Chrysanthemum Society; award of merit, R.H.S. GOLDEN WEDDING, richest golden flower; flowers 10 to 12 inches in diameter; awards of merit, N.C.S., F.C.C., N.C.S. GRAPHIC, very large, silvery shade below, inside rosy mauve. INTERNATIONAL, color salmon, shading to soft primrose; enormous flowers have been shown 18 inches across: a leviathan. JEAN DELAUX, twisted petals, dark brown crimson, reverse golden. JOHN SHRIMPINGTON, velvety crimson, golden reverse. KING OF BUFFS, very large, golden salmon buff. KUMO-NO-UE or WHITE GOOD GRACIOUS, white petal, spirally twisted, every bloom coming alike to perfection. LADY HANHAM, golden rosy cerise, having light shades of gold, old rose, cerise and cream, very pretty: F.C.C., N.C.S.; award of merit, R. H. S. LADY E. SAUNDERS, soft primrose. MDME. C. ANDIGUIER, immense flowers, soft rosy lilac. MDME. EDOUARD REY, delicate rose; F.C C. MDME. OCTAVE MIRABEAU, white and rose, edged amaranth: remarkably long petals. MDME. RICOUD, rosy lilac, silvery reverse; F.C.C., N.C.S. MDLLE. LACROIX, rosy white, passing to white; 3 F.C.C.'s. MASTER BATES SPAULDING, lemon yellow, incurving and interlacing, very large. MASTER H. TUCKER, rich bronze, flushed red, very large. MEG MERRILEES, sulphur white, very large, and curiously formed, belonging to the Dragon section; a late flowerer. MISS DOROTHY

SHEA, terra-cotta, reverse buff; F.C.C., N.C.S. and R.H.S. MISS H. SIMPKINS, immense snow white; F.C.C. MISS STORER, blush pink, shading off cream. MR. A. G. HUBBUCK, chestnut red, gold reverse, very large; F.C.C. MRS. HARMAN PAYNE, very large, rosy blush; F.C.C. MRS. T. DEUNE, long twisted petals, deep pink; F.C.C., N.C.S. PRIMROSE LEAGUE, large, soft primrose, centre creamy white. PRINCESS MAY, pure white, drooping florets. PRINCESS VICTORIA, creamy white. RED GAUNTLET, dark crimson. ROBERT OWEN, golden bronze, deepening to reddish bronze; twisted, incurved and hooked, with long yellow points; very large. SNOWDON, immense white; F.C.C., N.C.S. THUNBERG, primrose. VAL D'ANDORRE. Red, shaded orange. VICOUNTESS HAMBLEDON, silvery blush pink; F.C.C., N.C.S. WABAN, immense flower, light rose pink. W. G. NEWITT, pure white; a huge flower, long drooping petals. W. SEWARD, a magnificent blackish crimson, very long florets. VIVIAND MOREL, deep mauve, one of the best.

STEEL TWEEZERS.

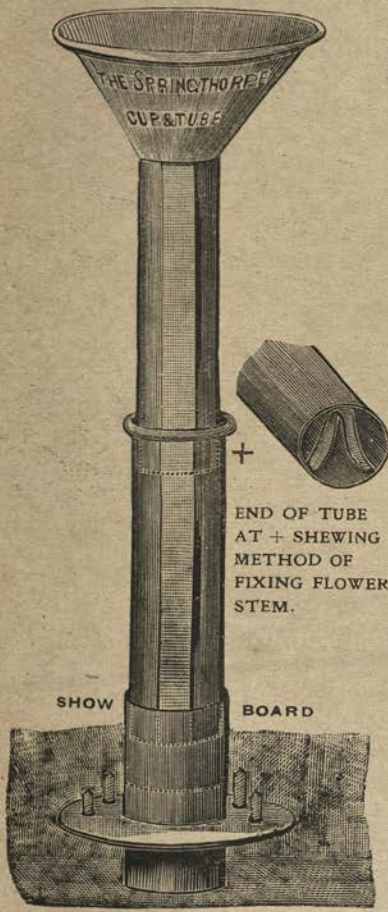
For pulling out the green eye or centre, and deformed petals.

IVORY TWEEZERS.



All who wish to have their blooms in perfect shape on the Exhibition Table must have these.

The next illustration is of tubes used for exhibiting Chrysanthemums and are the best for the purpose, and have been awarded highest recommendations by the R.H.S. and N.C.S. of any tubes yet exhibited.



END OF TUBE AT + SHEWING METHOD OF FIXING FLOWER STEM.

For Exhibiting Chrysanthemums & other Flowers.

The Cup has one Brass Side Spring which enables the exhibitor to adjust his flower with speed and accuracy in the Tube or Water Container. It also has a very simple arrangement to prevent the necessity of plugging × The Tube or Water Container has also one Brass Side Spring which passes through a Flange fixed to the Showboard from the under side.

By using these Tubes the exhibitor can raise his flowers seven inches from the board with instant adjustment.

ITS ADVANTAGES ARE –

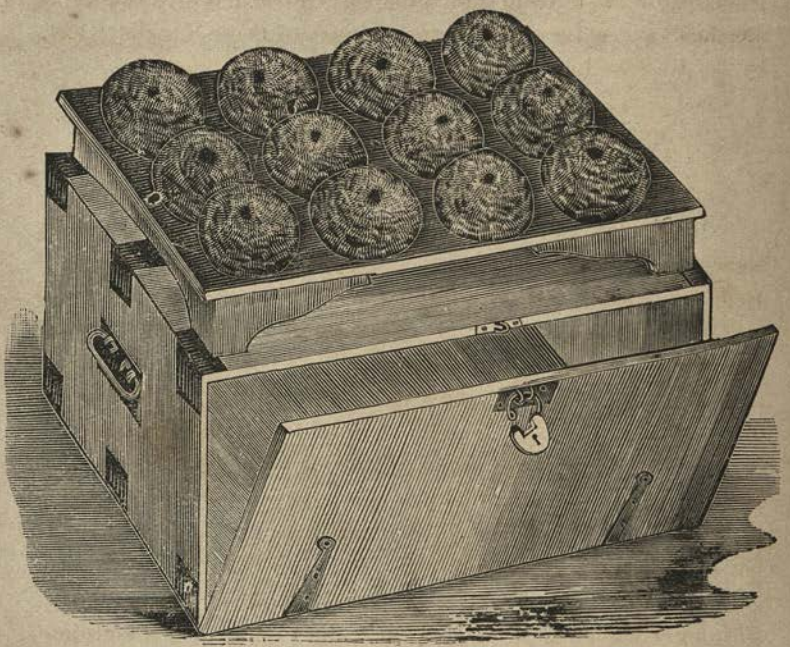
Simplicity, Ease of Adjustment, Durability, Efficiency, and Great Saving of Time.

For Incurved size, 1 inch diameter.
„ „ „ 2½ „ „
Japanese ... 3 „ „

Price 9s Per Dozen.

The next requirement for exhibiting your Chrysanthemums is a Show Box, which you might get with cups and tubes complete, as illustrated on following page, or you could get the Show Box and stand without the cups and tubes.

SHOW BOX AND STAND, WITH CUPS AND TUBES COMPLETE.



Show Box, painted and varnished, with two stands for 24 blooms, 24 Cups and 24 Tubes.

Show Box, painted and varnished, with one stand for 12 blooms, 12 Cups and 12 Tubes.

Show Box, painted and varnished, with one stand for 6 blooms, 6 Cups and 6 Tubes, and best Camel-hair Brushes for dusting the blooms.

CIENKOWSKIA.

Nat. ord., Scitamineæ.

A plant so closely allied to *Kaemferia*, that it is now included among them. For cultivation, see *Kaemferia*, but grow in a grass conservatory only. *C. Kirkii*. A herbaceous perennial, with lovely pale rose-purple flowers about 3 to

4 inches in diameter, very sweet-scented. Flowers with a golden spot in centre and on a many flowered scape 3 to 4 inches long. Leaves elliptic-lanceolate 6 to 8 inches long by 2½ to 3 inches broad. Height 6 inches.

CINERARIA.—*(Pot-plant, Florist's plant.)*

Nat. ord., Compositæ.

Cinerarias are most delightful flowers and extremely showy, but only raised with great difficulty in the plains of Bengal with any degree of success, thus, as a rule, they are treated as annuals. Yet I would recommend their being cultivated, making sowings, as soon as the rainy season has passed, under glass in shallow pans well-drained, in a compost of equal parts of rich loam, leaf-mould and old cow-dung or old horse-dung well decomposed, mixed with a good quantity of sand or charcoal dust. This is the best soil that can be used for them *in any locality*. Then treat them as below described, but never expose them to the full rays of the sun; and grow them in a grass-house, or glass-house or conservatory. Firminger says,—"It is utterly vain to cultivate the choice florist's plants of this genus in the plains." I cannot agree with this. In many districts in the North-West of India they are grown with complete success. In Mr. C. G. Ollenbach's garden in Dehra Dun, he grows them well and sends them up for sale to Mussoorie in April in full flower, and there are many amateur gardeners who grow them. The chief thing is to grow them on without any stopping, and to have them as if bedewed, green and healthy. They are hardier than Calceolarias, and the treatment of growing them from seed the same; but they must be grown fast, which is the secret of growing them. A cool atmosphere is most congenial to them. See every morning that their leaves are standing erect and foliage covered with a dew-like moisture: if not, then syringe them well and water carefully. They cannot stand draught.

In hill-stations the seeds of Cinerarias should be sown as in England, in March or in October, in shallow pans, in which the above compost is placed *over good drainage, but in the seedpans allow more sand* than you will afterwards use when you transplant them.

When they are strong enough, put them separately in three-inch pots, and plunge the pots till they are well grown. After this, harden them by degrees, by exposing them more and more; then place them in a sheltered situation out of doors. (This cannot be done in the plains, where they must be kept in a grass-house.) As they grow they must be shifted to larger pots. When large plants are desired, the first flowering stem that appears must be cut off close to the bottom, leaving not more than an inch of it.

Later sowings of Cineraria may be made in hill-stations in April and May. These, if grown on, may flower in autumn, or, if they do not, will flower in spring the following year. To keep old plants: cut them down just after they have flowered; remove all earth from their roots; and pot each of the suckers in separate pots. A good Cineraria should have a white ground so as to set off the other colors, and each color should be distinct and well defined, with a clear edge. Since writing the above, I have cultivated Cinerarias with great success in the hills at an elevation of 3,600 feet in Darjeeling, and again in another hill-station, sowing the seed in pots in the shade without any glass covering. When large enough to handle I pricked them out and planted them in tubs, in partial shade, and I have thus obtained as fine plants and flowers as I have seen in England reared with the greatest care. Named varieties are unknown in India, as florists generally sell mixed seed.

The double varieties are not so attractive as the single ones, and are known as *Cineraria Hybrida*. *Cineraria Maritima* is a perennial with silvery foliage, and is best treated as an annual.

CIPURA.

Nat. ord., Iridea.

These are small bulbous plants bearing flowers in terminal heads. When they are done flowering, the flower stems bend down to the ground and form fresh plants. They are much like the Iris. It is best not to water them much in winter in hill-stations.

C. Northiana, yellow. *C. Humilis*, blue, with yellow centre. *C. Paludosa*, white. *C. Plicata*, white flowers, which open when the sun goes down.

CISSUS.—*(Creeper: ornamental foliage.)*

Nat. ord., Vitaceæ.

A plant of great beauty,—the foliage being of an ornamental character. The leaves are about five inches long, lanceolate, mottled red, white and dark green, and borne upon red foot stalks. Plant them in pots well drained and filled with porous soil. They must be kept in shade and in a humid atmosphere, and in such will thrive vigorously and display the splendour of their leaves. A plant house suits them admirably. Dark situations are congenial to it. If the plant is treated as described above, the leaves will be velvety and altogether exquisite in appearance. They are easily propagated by cuttings put under glass in sand. This plant may be found growing wild at the lower elevations of the Darjeeling Hills.

Cissus Discolor: flowers insignificant. Leaves many-colored, cordate, oblong and pointed. The upper surface of a lovely bright velvety green, spotted white, and the under surface deep red purple.

C. Porphyrophylla belongs to the genus Piper. I do not know if it has been introduced into India yet. This is a native of Borneo.

CISTUS.—*(Rock rose. Shrubs.)*

Nat. ord., Cistineæ.

These are very handsome shrubs and could be well grown in India in the hills, but I do not know if it has ever been introduced. The color of their flowers are very rich and texture delicate. Propagated by seed. It would do well in the hills, if not in some of the cooler localities in the plains. Native of South of Europe and North of Africa.

There is a large variety of this plant.

C. Crispus, C. Hirstus, C. Laxus, C. Longifolius, C. Monepeliensis, C. Oblongifolius, C. Obtusifolius, C. Purpureus, C. Rotundifolius, C. Vaginatus, C. Vilosus, C. V. Canescens.

These are the best varieties.

CITHAREXYLUM.—*(Fiddle wood.)*

Nat. ord., Verbenaceæ.

These have principally white flowers and are shrubs or trees. *C. Subserratum* bears white sweet-scented flowers. *C. Caudatum, C. Dentatum, C. Quadrangulare, C. Villosum* and *C. Cyanocarpum*. These grow in almost any soil, and are propagated by cuttings in the rains.

CLARKIA.—*(Annual, hardy.)*

Nat. ord., Onagraceæ.[1]

A pretty annual when in bloom, with its pink, magenta, white and red flowers. They delight in a rich light soil. Sow them in the border or pots, where they are to remain, as they do better in this way, though they may be transplanted, but do not stand it well. In the plains sow the seeds at the same time with other annuals in October, and in hill-stations in March and April. There are several varieties or more of this annual :—

C. Integripetala alba.

C. Tom Thumb.

C. Tom Thumb, integripetala.

C. Pulchella flore-pleno, which is a double variety, and of a magenta color; very handsome.

CLAUSENA.

Nat. ord., Rulaceæ.

C. Heptaphylla: a small plant with leaves which, when bruised, emit an odour of anise. Bears insignificant yellowish-green flowers, succeeded by green berries. *C. Pentaphylla:* a tree of no merit for a garden. Propagated by cuttings in the rains.

CLEMATIS.—*(Creepers. Virgin's bower.)*

Nat. ord., Ranunculaceæ.

These plants do very well in the hills of Mussoorie, the North-West Provinces and Simla, and probably in Darjeeling too. They are most charming plants, and there are a great variety of them to select from. They enjoy a good light soil. Frequent watering of liquid manure assists them in flowering very much. Propagate by layering, which is the easiest method, and they take a year to root. Anyway, the method is certain. Cuttings strike, but not readily. Seedlings flower the second or third year. There are many types of Clematis, each with their varieties.

Type *Jackmanii* and its varieties; *Langulinosa* and its varieties; type *Florida* and its varieties, which are double flowered, etc., etc. The greenhouse Clematis, type *Indivisa*, is cultivated in the same way as the foregoing. There are a few Clematis which are not climbers; these are shrubs and herbaceous plants.

CLERODENDRON.—*(Shrub.)*

Nat. ord., Verbenaceæ.

These are very handsome shrubs—a very large genus, comprising about seventy-five species. In pruning them cut away shoots of the previous year's growth, as they flower on

the tops of the current year's shoots. Below are a few of the varieties:—

C. Kæmpferi has coral crimson flowers: shrub 3 feet.

C. Hastatum, with greenish white flowers: large, tall growing.

C. Pyramidale, crimson, shrub 3 to 4 feet.

C. Urticaefolium, crimson scarlet, 2 to 3 feet.

C. Splendens, a small climber, glowing crimson flowers. Lives with difficulty in Calcutta; good for the hills. Flowers in January, and very fine.

C. Squamatum, about 4 feet high: coral crimson flowers in April or May.

C. Fallax, violet, flowering in March, 3 feet.

C. Nutans, white, in November, very pretty, 8 to 10 feet.

C. Siphonathus, white tubular flowers, a small shrub.

C. Phlomoides, sweet-scented creamy white flowers: a small shrub. A jungle flower not worthy of cultivation in a garden.

C. Thomsoni, a lovely climber of new introduction, flowers having a white calyx, purple corolla and tube, and crimson limb. Very choice.

C. Wallichianum, blue flowers.

C. Speciosum and *C. Balformianum*, new importations.

All grow in the open beds of any garden having moderately good soil; propagated by cuttings.

CLIANTHUS.—*(Shrub.)*

Nat. ord., Leguminosæ.

Clianthus puniceus, called the *Parrot's beak* and *Glory pea*, with pendulous flowers like a pea, about two inches long and

of a scarlet color. A pretty plant. It flowers abundantly in a dry climate

Clianthus magnificus, scarlet.

Clianthus Dampierii, bright scarlet with a black spot in the centre. Sow the seed in the plains in October, and in the hills early in spring, and it will flower the same year. They may also be raised by cuttings. Syringe well to keep off red spider.

CLINTONIA.—*(Annual.)*

Nat. ord., Lobeliaceæ.

A truly lovely little annual. Sow seeds of Clintonia in October in the plains, and in spring in hill-stations. Prepare the pots you intend to sow in with a rather sandy soil, composed of leaf-mould, old manure, and sand. The seeds are like dust, very small : so, to distribute them evenly (as sowing them thickly is injurious to them), mix them with dry sand and scatter them thinly over the pots. Cover the seed very lightly indeed, or only press the soil down with the palms of your hands, and place the pots in which they are sown in pans of water. When the seeds germinate, the pots may be taken out of the water pans, and when the plants are strong enough, transplant them by threes in pots (or plant them out in beds if in hill-stations or in a cool climate). Transplant them repeatedly into rich soil; the richer it is the finer the bloom will be. Keep constantly pinching off the tops to stop them, and they will flower in great profusion and rival almost all description. They must be kept well watered, as they are at once checked in their bloom if not regularly attended to in this respect. Their flowers are blue, of dazzling beauty, and either yellow or white-eyed. Lobelias are treated in exactly the same way. Hung in baskets, they are exceedingly pretty.

CLITORIA.—*(Mussel-shell Creeper, or Butterfly-pea.)*

Nat. ord., Leguminosæ.

A very pretty small slender creeper, which is very common, but nevertheless very handsome, with its numerous

flowers, which may be seen the greater part of the year. It is not very extensive in its growth, and may be grown in a pot. Being hardy to an extreme, it may be grown in any soil; but that which suits it best is a moderately rich and rather sandy soil, in which it flowers most abundantly, with pea-like blossoms; some varieties bearing blue single and blue double flowers, some white and double flowered, and another variety of a light blue. The commonest are the single flowered varieties of all these colors. Firminger mentions *C. Erecta* "a plant of an upright growth with thick leathery leaves," bearing "pale lavender flowers." Many new varieties have been introduced since then. All the varieties may be obtained from seed most readily.

CLIVIA.

Nat. ord., Amaryllideæ.

These are Cape bulbs, which do well in the plains if started in February and allowed plenty of moisture. They are evergreen, and bear handsome heads of flower on a scape 1½ feet high. Flowers red-yellow, 48 to 50 in number, tubular, Strap-leaved plants.

The best is *C. Nobilis.*

C. Gardenia and *C. Lindenii*, as well as *C. Nobilis*, have been sent out to this country wrongly called Imontaphyllum. They should be started in the hills early in spring.

COBÆA SCANDENS.—*(Creeper.)*

Nat. ord., Polemoniaceæ.

An ornamental creeper of large growth, having finger-formed foliage and large deep purple bell-shaped flowers. The seeds are flat, and out of a number *very few* will germinate; they should be planted edgeways. In the plains sow them in October, and in hill-stations either in October or April-May. They do not readily live to a second season generally in the plains, but in the hills are perennial. Sow

the seeds in large pots, of which the soil is composed of old lime and brick rubbish mixed with soil: in this the color of their flowers will be more intense. There is also a variety with greenish white flowers. *C. Macrostema* is a new variety, more peculiar than pretty.

COCHLOSPERMUM.—*(Yellow Cotton Tree.)*

Nat. ord., Bixineæ.

C. Gossypium. This is a handsome tree, bearing fine large buttercup yellow flowers. Its leaves are three to five-lobed, the lobes being acute, entire and somewhat downy or velvety beneath. Propagated by seed.

COCHLIOSTEMA.

Nat. ord., Commelianaceæ.

I do not know if this has been introduced, but it is well worthy a trial, being a lovely plant. It should be planted in a compost of peat, leaf-mould and loam in equal parts, and requires perfect drainage and copious watering. It is propagated by seed, which should be sown fresh.

C. Jacobianum, blue, sweet-scented.

C. Odoratissimum is another form of the above, described as having outer perianth and segments yellowish green at the base and reddish above, inner segments large, deep blue, with a large white claw.

The seed is produced by fertilization, as it does not fecundate itself. Should be sown, when ripe, in sandy soil.

COCOS.

Nat. ord., Palmeæ.

These in their native habitats grow to large and majestic proportions. Many have been imported from the Eastern Islands, Ceylon, Australia and South America to England.

The King Cocoanut, the Dwarf Cocoanut, the Bramin Cocoanut, and several others.

C. Plumosa is a species which is highly ornamental. Its fruits are edible, about the size of an acorn.

C. Australis, very ornamental.

C. Romanzoffiana.

C. Schizophylla, is a dwarf variety.

C. Weddeliana is said to be the handsomest variety. A native of South America.

There are several other varieties.

CODIÆUM.—(*Croton. Ornamental foliage.*)

Nat. ord., Euphorbiacæ.

In Lower Bengal, where west winds are not prevalent, crotons grow readily in the open, but where these winds prevail, they are better grown in large pots, placed in the shade in a sheltered verandah or plant-house, or their leaves never attain the beauty they otherwise would, and they are exceedingly ornamental as regards foliage. They have insignificant flowers.

During the rains they are readily propagated from cuttings placed in a box of ordinary soil.

Below, I give a short description of some of the best varieties, adding some of the newer varieties :—

C. Pictum—Is, I think, the handsomest of the old varieties, and I could not give a more appropriate description of it than Firminger does in his book when he says of the leaves, "they are six or seven inches long, lanceolate, pointed, smooth-edged, leathery, and glossy; the upper surface of a pure rich green, marbled with blotches of cream color, and here and there, as it were, spotted and stained with blood. Each leaf, in fact, is a perfect picture in itself, resembling somewhat the gem called bloodstone." This shrub grows about four feet high.

C Variegatum—Much the same height as the last, but not so wide-spreading. Its leaves are strap-formed, polished,

deep green, and about an inch broad, stained with red and cream colored blotches.

C. Latifolium.—This grows in good soil to five feet in height. Its leaves are about a foot long, of not such a deep green as *C. Pictum*, and are about two inches broad, with their mid-ribs cream colored.

C. Longifolium—Has green leaves a foot-and-a-half long and a third of an inch wide.

C. Longifolium—Has leaves similar in dimensions to the last but the mid-rib is cream colored or yellow.

C. Grande—A handsome plant, with noble foliage of large green leaves with their mid-ribs and veins of a purplish red color. The leaves are lanceolate, rounded at the points.

C. Undulatum—Has leaves much of the same form as *C. Grande*, sparingly spotted with blotches of cream color or yellow, and undulating near their centres.

C. Aucubæfolium—Has leaves of the same form as the two before mentioned Crotons, but narrower, and thickly spotted with yellow. This is a very handsome plant.

C. Aureamaculata—Has medium-sized leaves, lanceolate, sharp-pointed, most beautifully and thickly spotted with yellow.

C. Veitchii—Has lanceolate sharp-pointed leaves smudged down their centres with shades of red.

C. Interruptum—A most curious leaved plant; the peculiarity lying in many of its leaves having a corkscrew-like twist near their foot stalks, and many of them having interruptions here and there, the continuations being only connected by their mid-ribs. The leaves are strap-formed, and are beautifully blotched and smudged with shades of red, cream color, and yellow.

C. Trilobum Albertii—Has bright green leaves which are, as its name describes it, three-lobed, the centre lobe being the longest.

C. Nobilis or *Jacksonii*—Is a very beautiful Croton with strap-formed drooping leaves of great length, splendidly blotched and spotted with different shades of red, cream, and yellow, on a dark green ground. This, I think, one of the handsomest of Crotons, with *C. Youngii*, which is much like it.

C. Multicolor—Is also a very handsome plant with very irregularly formed leaves, blotched, streaked, and spotted with cream color, red and yellow.

C. Maxima—Has very long narrow-pointed leaves tapering to an end gradually. The edges of the leaves are as if prettily crimped along their edges, and are blotched with red and yellow.

C. Irregulare—Has most irregularly shaped green leaves, scarcely two of them being alike.

C. Wisemanii—Has grand leaves fully two feet in length, which are beautifully veined and ribbed with yellow.

The following are among the newest and best varieties, in addition to those before described :—

Abbottiana or *Aureo Lineatum*
Albicans.
Amabilis.
Audreanus.
Augistifolium.
Augustifolia gigantea.
Appendiculatum.
Attunata.
Baptistii.
Baronne de Rothschild.
Bicolor.
Bismarckii.
Burtonii.
Challenger or *Imperator.*
Chelsonii.
Concinnus.
Contortus.
Cooperii.
Cornutum.
Crown Prince.
Diversifolia.
Dormannianis.
Elegans.
Elegantissimum.
Evanseana.
Fengii.
Falcatus or *Variabilis.*
Fucatus or *Lacteum.*
Gloriosa or *Princess of Wales.*
Goldii.
Hasteferus.
Hawkernii.

Hendersonii.
Hillianum.
Hookerianum.
Handbury Anne.
Hybridum.
Imperialis.
Jacksonii or *Nobilis.*
Jamesii.
Johannis.
Lancifolium.
Longifolium (Australian Sp.)
Lowi.
Macafianus.
MacArthurii or *Warrenii.*
Maculata Katonii.
Macfarleyanus.
Magnolifolium.
Majesticum.
Massanguinea.
Medium.
Mooreanum.
Mortii.
Mutabilis.
Newtonii.
Ovalifolium.
Paradoxum.
Picturatus.
Prince of Wales.
Queen Victoria.
Regale.
Reginæ.
Rex.
Rosea picta.
Rotundifolium.
Royal Prince.
Schomburghiana.
Splendidum.
Spirale.
Sp. from Madras.
Sunset.
Superbens.
Trilobus.
Trilobus Sp.
„ *Disraeli.*
„ *Earl of Derby.*
„ *Lord Cairns.*
„ *Traveller.*
Troquatus.
Triumphans.
Tortilus.
Truffauteanus.
Volutum.
Washingtonii.
Williamsii.
Wrightii.

Since the above list was made out, several new Crotons have been introduced, the latest however of consequence being—

Croton Aucubæfolium Gigantia; Aucubafolius being introduced, this variety has leaves richer in color and double the latter's size.

Croton Aureo Spirales, Croton Duke of Albany, Croton Gordonii (a hybrid produced by a cross between Wisemanii

and Longifolium, by Baboo S. P. Chatterjee, at the Victoria Nurseries, Calcutta, a really splendid and elegant Croton).

Croton Indian Prince, Croton Little Gem, Croton Maharajah Durbangah, raised by Mr. C. Maries, Croton Princess of Wales, Croton Schomburghia.

It must be borne in mind that, however hardy these plants may be, for they grow in almost any soil, and exposed to the vicissitudes of all sorts of weather, they never attain that beauty of foliage they would if grown in good soil, manured with leaf-mould and cow-dung, and sheltered from strong winds, which batters their leaves dreadfully. I would, therefore, recommend them for pot culture : occasional watering with liquid manure does them much good. In the shade of a plant-house their leaves are most beautiful.

Crotons should be re-potted once a year, as they will be found to send out a perfect mesh work of rootlets, which fill the pots, if the plants are in vigorous growth, in a few months. These plants amply repay the little care that they require to keep them in perfection, and washing their leaves so as to free them of dust will shew the amateur what beauty these plants attain when thus grown. Crotons do not stand the climate of hill-stations. They have lately not been in such favour as they used to be.

COFFEA—*(Shrub: The Coffee Plant.)*

Nat. ord., Cinchonaceæ or Rubiaceæ.

Both *C. Bengalensis* and *C. Arabica* are most ornamental plants. Their leaves, like those of the Croton, are leathery, pointed and lanceolate, of a dark, shining green. In February the bushes are covered with flowers, which are white and of great substance; extremely pretty to look upon against the dark-green polished foliage. Sow the seeds almost at any time, but preferably during the rains. The berries must be sown whole and with the foot stalk on them, or they will not germinate so readily, if at all. They may be propagated

from cuttings in sand, and thus produce flowers and berries when quite small plants.

C. Arabica, C. Bengalensis, C. Liberica, C. Travancorensis.

COLCHICUM.

(Nat. ord., Liliaceæ.)

See Bulbocodium, the cultivation being the same. They are only suited to the hills.

C. Alpinum, deep rose.

C. Arenarium umbrosum, violet purple.

C. Bivonæ, checkered white and purple.

C. Byzantinum, rose.

C. Luteum, yellow.

C. Montanum, very light purple.

C. Parkinsoni, strikingly tessellated and barred purple.

Bulbocodiums are closely allied to them. The bulbs should be put down in October or November, and left to endure the cold, which is necessary to them.

COLEUS.—*(Shrub and pot plant. Ornamental foliage.)*
Nat. ord., Labiateæ.

Highly ornamental plants, of which a great variety have been produced. When Firminger wrote his book on gardening, he named two varieties: it would be difficult at the present time to name the number that have been produced by hybridising. These plants make pretty beds, by putting down cuttings; or the stems of old plants may be pegged down. They require to be renewed frequently, or they grow straggly or scraggy. They love a rich soil and plenty of sunlight. The best cuttings are from the end of a branch. Plants from cuttings from the stems take longer to develop their colors, and they frequently sport or show colors not in the parent they were taken from. Imported seeds often produce new varieties.

Readily multiplied by cuttings, they can be increased most rapidly. The new large leaved varieties are by far the handsomest. In the hills they only outlive the winter with difficulty, and must be kept under glass or in a warm conservatory at high elevations during the winter months, especially in the North-West hill-stations.

COLLINSIA.—*(Annual.)*

Nat. ord., Scrophulariaceæ.

A pretty annual, with a profusion of bloom, and very attractive in beds or in mixed borders. Sow the seeds at the same time as other annuals. The following varieties make pretty ribbon borders: *C. Bicolor*, *C. Bicolor alba*, *C. Bicolor atrorubens*, and *C. Multicolor marmorata*. *C. Verna*, a lovely early flowering species, has sky-blue flowers.

COLLOMIA COCCINEA.—*(Annual.)*

Nat. ord., Polemoniaceæ.

This is a very old annual, which bears dense heads of red flowers, in my opinion not at all attractive, though it is cultivated in England, but not to the extent it used to be.

COLOCASIA.

Nat. ord., Aroideæ (araceæ.)

A small genus of plants not much known in this country up to this date. Their flowers are unisexual, the female separated from the male by short ovoid neutral organs.

C. Odoratum is met with in Calcutta under the name of *Arum odoratum.*

C. Giganteum is a noble species suitable to a plant-house.

C. Indica is a native of the Sandwich Islands.

COLUMBINE.

See *Aquillegia.*

COLVILLEA.

Nat. ord., Cæsalpineæ.

A tree thirty feet or more high—too large for ordinary gardens. Showy bright orange colored flowers and pinnate foliage. Propagated from seed.

COMBRETUM.—*(Climbers.)*

Nat. ord., Combretaceæ.

These plants, of comparatively recent introduction to Calcutta, are very fine. They are difficult to propagate. Young shoots should be selected as cuttings, and these should be firm and short-jointed. *C. Comosum* bears bright crimson brush-like flowers in abundance, which cover the plant. *C Macrophyllum*, a most magnificent plant, bears brush like flowers of deep carmine. *C. Densiflorum*, leaves large and crimson, flowers in the cold season. *C. Pincianum*, of rampant growth, with vermilion and cinnabar colored brush-like flowers in great profusion in February, when almost leafless.

These are the best of the Combretums, which should all be thinned out when pruned once a year.

CONVALLARIA.—*(Lily of the Valley. For the hills.)*

Nat. ord., Liliaceæ.

Lily of the Valley, so well known to most English gardens and so easily cultivated there, is not easily dealt with here. I would recommend it being grown under a hand glass in the hills North-West of India, or in a glass conservatory, as at the time it comes into flower, the atmosphere is too dry for it. On receiving the clumps, they should be planted at once in a light soil, lightly placed about the roots, and they should then be forced on with a little bottom heat. I have only once seen them naturalized in this country in the hills, when they grew freely, flowering every year, but I am not sure if this was the true variety. Very often they only survive to flower and die afterwards.

CONVOLVULUS.—*(Annual Creeper.)*

Nat. ord., Convolvulaceæ.

Convolvulus tricolor, a most beautiful creeping annual, with which everyone is acquainted. In the vicinity of Calcutta, Firminger says, it does not succeed well, but further

up-country it does very well, and flowers freely. In the North-West Provinces it flowers in perfection, and also in the hills. Sow the seeds at the same time with other annuals in any rich garden soil, adding a little sand to it, old manure, and leaf-mould.

Grown in baskets, it looks very handsome.

Convolvulus pentanthus is a most beautiful perennial creeper, bearing small azure blue flowers in great profusion. It is not unfrequently called *Ipomœa semperflorens*, a common but exceedingly pretty plant.

Convolvulus Major or *Morning Glory* is, I think, the most beautiful of all the annual *Convolvuli*. Its flowers are of *every* shade of color, sometimes tipped or bordered with white. These flowers close about mid-day, or earlier.

Henderson's Imperial Giant Japanese Morning Glories are a grand improvement. The flowers are of many colors, all edged with white. The leaves themselves are lovely, mottled and dotted with variegation: but they do not all come true from seed.

Then there are *Henderson's Ruffled and Frilled* Convolvuli of many colors and with white edges. These are fine novelties of great merit.

Convolvulus, or rather *Ipomœa rubro-cæculea*.—This has exquisitely pretty azure blue flowers, which are open most part of the day, but fade towards evening. The flowers are very large and of a lovely color. Seeds should be sown in October in the plains, and in April in the hills: but at high elevations require heat.

CORDIA.

Nat. ord., Borragineæ.

Rather handsome trees and shrubs, some of them with gorgeous flowers. Propagated by cuttings in sand or by layering. *C. Decandra*, white. *C. Sebastena*, orange. *C. Superba*, white. Their flowers are long funnel-shaped, rather open campanulate at the top, and apex widely opened out.

CORDYLINE.

See *Dracæna*.

COREOPSIS.

See *Calliopsis*.

CORYNOSTYLIS.

Nat. ord., Violarieæ.

These are elegant climbing shrubs, with handsome large white flowers, with five petals, the lower one, being the largest, drawn out below a large pouch, which is compressed on both sides, constricted in the middle, and twisted.

C. Albiflora, white horn or trumpet shaped, two inches long, pedicels long and thread-like. Leaves ovate acuminate.

C. Aubletii, white, in racemes, leaves oblong-ovate acuminated.

CORYPHA.

Nat ord. Palmeæ.

Syn. Taliera.

Many of these fan palms have been introduced to India, while one is a native of the Malabar Coast, namely, *C. Umbraculifera*, which has very large leaves forming a complete circle. *C. Australis* is a synonym of *Livingstonia Australis*. *C. Gebanga*, fan-shaped leaves, divided fully half their length.

COSMOS.

Nat. ord., Compositate.

These are annuals or perennials which are rather pretty. *C. Diversifolia* is a perennial, sometimes known as *Dahlia Zimapani*, and *Biden's Diversifolia* is a single dwarf dahlia-looking plant, bearing flowers of a deep purple. Height 1½ feet, foliage deeply cut and elegant. Cultivated from seed sown in October in the plains, in April in the hills. If sheltered in winter, they live on for some time in the hills.

C. Bipinnatus is an annual, and must be sown in the same manner as the above species.

C. Scabiosordes is like *C. Diversifolia*, but with scarlet flowers: is perennial, with tuberous roots.

CRASSULA.

Nat. ord., Crassulaceæ.

Rather pretty fleshy shrubs or herbs, which may be propagated by cuttings first allowed to dry a little after cutting. They are very ornamental, with a grotesque appearance, and thrive well in the hills in a mixture of sandy loam and brick rubbish in well-drained pots.

C. Arboresceus, shruby plant, 2 to 3 feet high, with rose colored flowers in panicles.

C. Bolusii, pale flesh colored.

C. Ciliata, cream.

C. Coccinea, scarlet. A plant from the Cape.

C. Cooperi, white.

C. Jasminea, white, becoming reddish.

C. Ericoides, white.

C. Versicolor, sweet-scented, white with a red margin.

CRATAGUS. – *(Hawthorn: Shrubs: on the hills only.)*

Nat. ord, Rosaceæ.

The seed should be procured from home, and, as soon as received, should be planted. The double white and pink are handsome varieties. The seeds take a long time to germinate, not unfrequently months, and then they germinate one or two at a time all through the following year. The Hawthorn grows very slowly. The finer kinds are generally budded or grafted in England. The Hawthorn is not at all suitable to the plains. I have seen it grown in Mussoorie, where it flowered well.

CRINUM.—*(Bulbous : sweet-scented.)*

Nat. ord., Amaryllidaceæ.

There are a great many varieties of this genus of bulbous plants, many of them being much alike. A few of them look very well in a garden.

C. Longifolium, a common variety, scented.

C. Defixum, scented.

C. Canaliculatum, flowers white, scented.

C. Superbum, rose colored, scented.

C. Verschaffeltianum, of recent introduction, much like a Dracæna in appearance. A fine plant.

Most of the varieties have leaves over a foot-and-a-half or two feet long; some have even larger leaves, but they are narrower. Propagated by division.

CROCUS.—*(Bulbs. For hill-stations.)*

Nat. ord., Iridaceæ.

In the hills they may be planted in beds successfully in almost any soil and situation. They should not be planted more than an inch-and-a-half to two inches apart, and in rows of different colors look exceedingly pretty Put the bulbs three at a time into the soil. They will require to be taken up every year, as the rains rot the bulbs. In selecting *Crocus* for planting in ribbons, choose distinct colors only, which will enhance their appearance greatly. After flowering, the foliage should not be cut off, but allowed to die down of its own accord. They are of many shades of color—white, yellow, purple, blue, and red.

CROSSANDRA.—*(Shrubs.)*

Nat. ord., Acanthaceæ.

Shrubs with four-cornered spikes of flowers borne at the extremities of the spikes. They are well known in our Indian gardens. Leaves lanceolate and pointed.

C. Guineensis, flower pale lavender.

C. Infundibuliformis is common: flowers reddish orange, rich in coloring.

CRYPTANTHUS.

Nat. ord., Bromeliaceæ.

A genus of Pineapple or *Billbergia*-looking plants, epiphytal, and requiring the same treatment as Billbergia.

C. Acaulis, with brownish foliage, wavy, recurved. See *Tillandsia Acaulis.*

C. Bivittatus, syn. *Billbergia bivittata.*

CRYPTOMERIA.—*(Trees and Shrubs.)*

Nat. ord., Coniferæ.

Cryptomerias can only be grown in the plains as small pot plants. In the hills they attain a very large size. The variety generally known there being *Cryptomeria Japonica*, which is a remarkably handsome conifer.

C. Elegans is a very elegant species, with drooping branches: height 20 feet.

C. Elegans nana: a shrub, which in winter gets tinted russet, except the tips of branches.

C. J. Lobii: much like *C. Japonica*, but with shorter leaves and deeper green colored foliage.

C. J. Nana: a small shrub, useful, grown on rockeries.

C. J. Spiralis, with leaves spirally arranged round its branches.

CUPHEA.—*(Annual and perennial.)*

Nat. ord., Lythraceæ.

These are profusely blooming plants when grown in a rich sandy loam. In writing of the annual varieties I may mention that they go on re-sowing themselves as the old

plants decay. For the following year's growth it is best to collect seeds from the plants first sown:—

C. Eminens, scarlet and yellow.

C. Hookeriana, vermilion and orange: a shrub 2 to 3 feet high, very striking.

C. Platycentra, or syn. *C. Ignea*, scarlet, white and purple ever-green.

C. Strigillosa, syn. *Cyanea*, red and yellow.

C. Zimapani, syn. *Lanceslata*, red violet.

C. Ocimoides, rich purple violet.

The annual varieties are half-hardy, and should be treated like annuals, and the perennial sorts, if sown early, will do for bedding the first year.

Sow the seeds in the plains in October and November and protect from frost. In hill-stations sow the seeds at the same time with other annuals in March and April.

These are among the most showy of annuals in English gardens.

CYCAS.—*(Ornamental tree.)*

Nat. Ord., Cycadeceæ.

These trees are very beautiful, with leaves very much like small palms. They are exceedingly pretty on a lawn by themselves, either singly or grouped together, or in plant-houses.

C. Circinalis: leaves dark green above, paler below, 6 to 12 feet.

C. Media: large leaves, very handsome.

C. Normanbyana: leaves downy or hairy on the underside.

C. Rumpii: slender stem.

C. Sphœria.

CURCULIGO.—*(The Weevil Plant.)*

Nat. ord., Amaryllidea.

These are most ornamental plants, with palm-like growth. Their cultivation is easy, but they are all the better of the shade of a grass conservatory and light sandy loam well drained.

They are propagated by suckers which form at the base of the stem.

C. Recurvata. C. Recurvata striata, leaves marked with a distinct band of white at the back, and peteoles whitish. *C. Recurvata variegata*, leaves beautifully striped white, plaited and recurved. Rhizome tuberous. *C. Sumatrina:* these require a conservatory in the hills.

CURCUMA.—*(Turmeric.)*

Nat. ord., Scitamineæ.

The ordinary turmeric is so well known that it requires no description; and the following plants are like it in all respects, but their flowers are very ornamental. *C. Albiflorus*, white flowered. *C. Australiasica*, many flowers on a spike, yellow, and bracts rose colored. *C. Petiolata*, flowers on a spike 5 to 6 inches long, pale yellow, bracts rosy purple. *C. Roscœana*, flowers on a spike about one foot long, scarlet, bracts bright orange. *C. Neilgherriensis*, flowers reddish yellow.

CURMERIA.

Nat. ord., Araceæ.

These plants require to be grown in a grass conservatory in the plains.

C. Picturata bears very handsome dark green leaves, with a broad silvery band down the centre. Plant stemless.

C. Wallisii is a stemless plant, with leaves 2 feet long by 1 foot broad, mottled pale yellowish green, turning later to a grey color. In the hills these require a glass conservatory.

CYANELLA.—*(Bulbs.)*

Nat. ord., Liliaceæ.

These are pretty little bulbous plants, natives of the Cape of Good Hope. They bear various colored flowers. The cultivation is the same as that for Ixias. They are of three varieties:—

C. Cupensis, purple.

C. Lutea, yellow.

C. Odoratissima, rose.

CYANOPHYLLUM.

Nat. ord., Melastomaceæ.

These plants derive their name from *kyanos*, blue, and *phyllon*, a leaf, referring to the reverse or lower side of the leaf. They are very beautiful foliage plants, that require to be grown in a grass conservatory in the plains.

C. Magnificum, leaves 1 to 2½ feet long by 9 to 12 inches broad: velvety green above, rib veins ivory white, underside reddish purple. *C. Bowmanni.*

C. Spectandum, leaves large, 10 to 20 inches long by 4 to 7 inches broad; dark velvety green, mid-rib metallic grey, tinged red, and prominent.

C. Asiaticum, propagated by cuttings put down in sand under a hand glass. They require a well-drained light sandy compost. In the hills they will require a glass conservatory.

CYANOTIS.—*(Wandering Jew.)*

Nat. ord., Commelynaceæ.

Plants that are of prostrate creeping habit, with very pretty leaves, very hardy and common. They take root at the joints as they creep along the soil, from which they are easily propagated. *C. Barbata, C. Kewensis, C. Nodiflora, C. Multicolor, C. Zebrina.* They are admirably adapted for rockeries.

CYDONIA.—*(Shrubs.)*

Nat. ord., Rosaceæ.

These shrubs are best suited to the hills, and there require little cultivation. *C. Chinense*, flowers rose colored, calyx fine parted, reflexed and downy inside: a small tree. *C. Japonica*, flowers deep scarlet, two or three together, but borne in profusion a great portion of the year. Fruit green, very fragrant, but not edible. Leaves glossy green. Plant 5 to 6 feet high. Propagated by layers and cuttings. *C. Mauler*, bright red. *C. Vulgaris*, common on the hills, the ordinary quince, flowers pale red or white.

CUPRESSUS.—*(Shrubs and trees.)*

Nat. ord., Coniferæ.

These trees are well known in India, so far as the first three varieties below mentioned :—

C. Tortuosa or Cashmeriana, which is a native of Bhootan.

C. Sempervirens, native of Italy.

C. Funiberis, native of North-East China.

C. Lusitanica, native of Goa.

C. Knightiana, native of California.

CYRTANTHERA.

Nat. ord., Acanthaceæ.

C. Catalapæfolia, flowers yellow, thyrse or panicle large and compact. A soft-wooded plant. *C. Aurantica*, syn. *Beloperone aurantica*. *C. Catalpæfolia*, bright golden yellow flowers in terminal corymbs. These plants bear tube-like flowers with gaping open lobes at the apex. Propagated by cuttings.

CYRTANTHUS.

Nat. ord., Amaryllideæ.

Bulbous plants from the Cape of Good Hope, which are very handsome. They thrive in light rich loamy soil, and do

better in the grass conservatory than in the open, and in the hills with some shade. Their flowers are incurved, tubular, six-cleft. Leaves long and narrow. They are propagated by off sets.

C. Augustifolia, flowers orange, drooping.

C. Lutescens, yellow.

C. Macowani, bright scarlet, in a large umbel.

C. M'Kenii, white, sweet-scented.

C. Obsequis, yellow, variegated orange, red and green.

C. Sanguineus, blood-colored, segments orange red.

C. Uniflorus, white, with a red stripe.

CYRTOCERAS.—*(Syn. Centrostemma.) (Climbers.)*

Nat. ord., Aselepiadeæ.

This is now considered a section of *Hoya*.

C. Reflexum, creamy white, but not so handsome as many of the *Hoyas* (known as wax-plants).

C. Multiflorum, corolla white, tipped buff, in drooping umbels.

See *Hoya* for cultivation.

CYRTODEIRA.

Nat. ord., Gesneraceæ.

These plants have exquisite leaves with beautiful markings, and grow well in our grass conservatories in the plains. They require to be grown in a good, light, rich, well-drained soil, with pieces of mortar interspersed, and do well in baskets or rockeries protected from the full blaze of the sun in both hills and plains, but they do not bear transplanting well. *C. Chrontalensis*, *C. Fulgida* and *C. Metalica*, much like *Gesneras*, but with variegated leaves, and much like each other.

CYCLAMEN.—*(Bulbous: ornamental foliage and flower plants. For Upper India and the hills.)*

Nat. ord., Primulaceæ.

Cyclamen seed may be sown in September, under glass, in a hot-bed. After this they must be exposed to more air, and be placed in a partially-sheltered spot. In April or May transplant them in pots, three or four in a pot, of a foot in diameter, and allow them to remain till they flower, in the cold season. The leaves are highly ornamental, and the flowers very beautiful. They are altogether most desirable plants. Their beauty will be much enhanced by sponging the leaves with soap and water occasionally, or syringing with tepid water.

The soil they are grown in should be the same as most bulbs are grown in, of a light nature (with some sand in it), mixed with leaf-mould and a little manure. Be careful to see that the drainage is good. If bulbs are procured, they should be planted only one-half of their depth under the soil. After they have done flowering do not disturb them, but let them die off by withholding water. When the plants have fairly dried, don't let the bulbs become dust dry in the pots Next season, when the bulbs begin to grow, take them up with as much earth as can be done without injuring the roots, and place them in the compost before-mentioned made afresh. Instead of planting three or four bulbs in a pot of a foot in diameter, each bulb may be placed in a four or five-inch pot, if it is preferred to have them singly.

They do not succeed in Lower Bengal, but do very well higher up country and in the hills. They are best cultivated in partial shade, such as that of a plant-house.

There are many varieties of *Cyclamen*:—

C. Persicum Giganteum, very large flowers, white, rose, red.

C. P. Grandiflorum, white with purple base.

A new strain of great superiority is the *new large double-flowered Cyclamen*, the petals of which are double and undulated, and also the *new feathered Cyclamen Bush Hill Pioneer*, which is the first variety of its kind, likely to become the forerunner of a new strain of *Cyclamen*, by the introduction of a colored feather and different form of flower. This is a lovely variety and a true novelty.

CYMBIDIUM.

See *Orchids*.

CYPRIPEDIUM.

See *Orchids*.

DACRYDIUM.

Nat. ord., Coniferæ.

D. Cupressinum: cypress-like tree, weeping branches.

D. Elatum: a large timber tree of slow growth, native of Penang; leaves crowded without order, erectly spreading "mucronate." Cultivated in pots in this country. Firminger describes it as like an Onychium fern.

D. Taxoides, a conical shrub. The branches have a purple tint when young. A tree.

These are only suitable to a temperate climate and the plains, not suitable to the hills.

DAEMONOROPS.

Nat. ord., Palmeæ.

See *Calamus*.

They are all tall palms.

DAHLIA.

Nat. ord., Compositæ.

This much prized and magnificent flower, though scentless, makes up for the want of perfume by an extra share

of beauty in the brilliancy of its color, perfection of form, and large size. It was named after the Swedish botanist Dahl, and belongs to the same family as the potato ; both Dahlias and potato being natives of Mexico, where it was found 5,000 feet above the level of the sea in sandy plains. It long remained in England unimproved, as it was considered that sandy soil was the proper compost for it; but a fresh and improved stock was imported from France, and florists took it up and improved yet further on it, till we see what we have now, a plant showy, hardy, and so diverse in the color of its flowers that it comprises all colors except blue.

The Dahlia may be multiplied by seed, by cuttings, and by dividing the tubers, each eye being separated with only a small part of the tuber making a plant.

Cultivation of the Dahlia and its after-management.

SEEDLINGS.—The seed may be sown in the plains in October, and in hill localities in March. In the latter places the seeds should be sown in pans and plunged into hotbeds; or the seeds should be sown in hotbeds (this will not be necessary in the plains, where the seed may simply be sown in pots in the ordinary way). The soil should be light and sandy, with a mixture of leaf-mould and cocoanut fibre. When they germinate they will require all the air that can be given them. Seed from the best varieties should be chosen, and that from the outer petals in preference to those from the inner, as the former will yield a greater percentage of double flowers. In nearly two months' time they will be ready to pot off singly in four-inch pots.

In about five or six months from the time of sowing they will begin flowering, when they should be carefully examined daily, for vermin are likely to attack them, and should be destroyed as soon as discovered.

All single and demi-single blooms should be thrown away, unless some desirable feature is presented, such as color, or

some peculiarity of growth, in which case they may be improved by further cultivation and crossing. When the plants are taken out of the seed pans and transplanted, the compost used should be less sandy, and have more leaf-mould and cow manure in it, so as to be of a richer quality.

Care should be taken in the selection of your plants: not unfrequently they improve under a second year's cultivation. Store the bulbs just as old tubers should be treated.

Cuttings: how to treat them.

Cuttings are taken from plants as follows: put down tubers in October in the plains, and in March in hill localities, over a hotbed. Soon after as many shoots as there are eyes in the tubers will appear, and as soon as these are two inches high take them off just below the leaves, and place each cutting in a small pot in a hotbed.

Some prefer cutting up the tubers with each eye on them separately, as soon as the eyes are distinguishable, and putting them back into the soil of the hotbed or in pots.

As soon as cuttings have taken root, they should be transplanted into five-inch pots and again placed in gentle heat. They should have plenty of air. A week after they are potted, water them with liquid manure.

In the plains prepare beds for them in December, and in the hills in May, if they are to be grown in massed beds, Drive in bamboo stakes close together, all round, so as to form the bed, leaving about a foot-and-a half to two feet of the bamboo stakes above the surface of the ground. This is done to raise the bed, as will afterwards be seen. Dig out some of the soil, say a foot of it, and in its place lay broken bricks or stones, and over this some finer gravel; on this place your compost up to the top of the stakes. Surround the stakes with a little earth and turf it to make it a grassy slope. The soil, if not light, should be mixed with a little sand, and with a large proportion of leaf-mould and some stable manure, or, what is better, cow manure; press this compost

down well and in it plant your Dahlias, with their bulbs not deeper than from half to three-quarters of an inch under the surface.

As they grow put up stakes and tie them loosely to them. Insects and worms should be carefully sought for and destroyed. Only one shoot should be retained if the flowers are to be kept for show, but should they not be intended for this purpose, two or three shoots may be kept according to the strength of the plant.

When the plants are in flower they should be carefully watered, and not allowed to flag in the least; frequent watering with clear liquid manure will improve the flowers.

Plants intended for show should be grown in a good proportion of peat soil if it is obtainable, otherwise it should resemble it as nearly as possible; and I should also mention, only one or two buds should be allowed on such plants. When the plants die down the roots should be dug up and stored in dry sand.

Dahlias are divided into sections as follows:—

Show flowers, which have their ground colors lighter than that of the tips, and are included with the self-colors.

Fancy varieties, which are striped or flaked with a variety of colors; also those with dark colored grounds and white or lighter tips. If the reverse of this, it is a show flower.

Pompons have smaller flowers than either of the above.

Pompon quilled are small and have quilled flowers.

Quilled flowers with scolloped edges.

Single Cactus, quite a new type during the past few years, with single twisted petals. Very popular just now; as also

Double Cactus, double with twisted petals.—Both Single and Double Cactus Dahlias have flowers of very bright colors.

Tom Thumb, the smallest flowers of all, plants from 1 to 2 feet.

Round or *Inverted-shaped flowers*, which are also exhibited.

There is at present a new Dahlia of quite a novel form of petals called *Grand-Duc-Alexis*, which will evidently be the foundation of quite a new type in a few years. The same is a much larger flower, and its petals are in rolls of regular form, both curious and pretty.

I think it would be satisfactory to grow Dahlias, starting them in the plains just before the rains set in. In the hills the wild Dahlias start in April, are single-flowered or semi-double, in all shades of color, and variegated: a sight worth seeing on the hill-sides in the North-West Provinces and Punjab hills.

Single Dahlias are popular in England, and are much cultivated to attain good form. In the plains these are easily grown as annuals.

DATURA.

Nat. ord., Solanaceæ.

Datura alba is a common weed in this country, but there are other varieties of Datura which are ornamental, and should be treated as hardy annuals, and planted in borders or beds; a single plant or so of each variety looks very well. Any soil suits them, but they grow best in a light rich soil.

D. Humilis flore pleno (clorantha fl. pl.) has very handsome double golden-yellow flowers, sweet-scented, and *D. Wrightii* (meteloides) has large white flowers edged with lilac, sweet-scented.

D. Ceratocaulon has white flowers striped with purple.

D. Fastuosa, white, double flowers.

D. Fastuosa violacea, double, violet flowers.

D. Knightii, double, white, sweet-scented.

D. Cuvilie, mossy foliage and stems, and white foliage. These are grown from seed only.

D. Suaveolens is a large shrub which bears white, sweet-scented flowers, and does not generally bear seed, but is

grown from cuttings. When seed is borne it is in long cylindrical pods.

D. Cornocopia is a novelty. Stems purple, exceedingly floriferous, flowers purple outside, French white within, 8 inches long by 5 inches across, seeds of which can be got from the Himalayan Seed Stores, Mussoorie.

DALECHAMPIA.

Nat. ord., Euphorbiaceæ.

These are of recent introduction and bear insignificant flowers enclosed in coloured bracts, for which these plants are cultivated; rather pretty slender climbers.

D. Roezliana: flowers small, fragrant. Bracts rosy pink.

D. Madagascarensis: greenish flowers. Propagated by cuttings in November or December.

DAPHNE.

Nat. ord., Thymelaceæ.

The best species of Daphne are—

D. Mezereum, with red flowers distributed among the branches, mostly in twos and fours, which expand before the leaves appear.

D. Odora, with fragrant flowers that are purple: many flowered.

D. Odora mazeli, with fragrant pink and white flowers on short lateral branchlets all along the branches.

D. Pontica, fragrant greenish-yellow flowers, in many flowered clusters.

D. Fortunei, dark lilac flowers, silky foliage.

All the above are neat looking plants, and though they may do in the plains, they do very much better in the hills.

Propagated by cuttings and layerings.

DASYLIRION.

Nat. ord., Bromeliacea.

Pineapple-looking plants, from the centre of which spring drooping leaves, which are variegated, terminating in a fibrous bunch.

D. Acrotrichum, *D. Glaucophylla* and *D. Recurva*. Cultivated in the same way as Bromeliads.

DAVALIA.

See *Ferns*.

DELABECHIA.

Nat. ord., Sterculaceæ.

Delabechia rupestris has little to recommend it except its peculiar gouty-looking stem, swollen out in the centre, and being a tree takes up some little space. Propagated by seed.

DELIMA.

Nat. ord., Dilleniaceæ.

D. Sarmentosa, rather a handsome climbing shrub, with obovate, ovate or broadly lanceolate leaves, which are rigid, rough and parallel veined. The flowers are white, in terminal loose racemes, yellowish white and very fragrant. Propagated by cuttings in the rains.

DELPHINIUM.—*(Perennial, but in this country, in the plains, treated as an annual. The Larkspur.)*

Nat. ord., Ranunculaceæ.

The seeds of Delphinium should be sown a little after other annuals in the plains, when the weather is decidedly cold in the mornings and evenings, about the end of November or beginning of December. In hill-stations it may be sown with other annuals. They enjoy a deep and highly-enriched light soil, and, with the solitary exception of *D. Cardiopetalum*, are all hardy perennials. They have exquisitely beautiful

flowers of all shades of color, from pearl white to the deepest blue and red, borne on spikes.

The following are the best varieties : —

D. Formosum, bright blue with white centre, 3 feet.

D. Cannell's Hybridum, 50 varieties mixed, 3 feet.

D. Grandiflorum, blue, 2 feet.

D. Nudicaule, light scarlet to crimson, 1 foot.

D. Sulphurea, yellow, 1 foot.

Delphiniums must be treated as annuals in the plains ; in the hills they may be kept over from year to year, and form fine clumps, but are liable to perish in the rains if not in a light, well-drained soil.

DENDROBIUM.

See *Orchids*.

DESMANTHUS.

Nat. ord., Leguminosæ.

A. Punctatus, a rather insignificant little sprawling shrub, remarkable chiefly for the sensitiveness of its leaves, and bearing round rose-colored flowers the shape of a bullet and of about the same size. Bears seeds from which it is propagated.

DESMODIUM.—*(The moving plant.)*

Nat. ord, Leguminosæ.

Desmodium Gangeticum bears lilac flowers in long spikes. A herbaceous shrub, with trifoliate leaves and peculiarly twisted seed vessels: not very interesting on the whole. Plants grow to about two feet high, and are propagated from seed.

DESMONCUS.

Nat. ord., Palmeæ.

A genus of very ornamental palms, with leaves pinnate and prickly, with long slender stems, ascending. When young

they are at their best for table decorations; when older they may be trained up a pillar or rafter of the plant-house. *D. Granatensis, D. Major, D. Minor.*

DEUTSIA.—*(Shrub.)*

Nat. ord., Philadelphaceæ.

A pretty shrub which grows about three feet in height. Firminger describes *Deutsia scabra* as bearing "white flowers in terminal racemes."

D. Gracilis bears small pure white flowers, which are borne all along the stems in terminal racemes in great profusion, early in spring. A lovely little plant. The roots are imported by seedsmen, and are well worthy of finding a place among our pot plants.

D. Crenataflore pleno is a very handsome variety of *D. Scabra*, which bears double white flowers in racemes or paniculate.

Propagated by division from suckers.

DIANELLA.

Nat. ord., Liliaceæ.

These are pretty shrubs, only represented by *D. Nemorosa* in this country, which bears insignificant flowers and brilliant blue berries, for which it is mostly grown. *D. Purpurea*, with grass-like leaves and pretty violet-purple flowers, succeeded by berries of the same color, is prettier: also *D. Laevis*, with bluish flowers in loose racemes and grass-like leaves.

D. Tasmanica is a large bush 5 to 6 feet high, with leaves 3 to 4 feet long, grass-like. It bears pale blue flowers succeeded by blue berries, and is a handsome ornament to a plant-house.

DIANTHUS.—*(Carnation, Pink, Clove and Picotee.)*

(Generally perennial.)

Nat. ord., Caryophyllaceæ or Silenaceæ.

This genus comprises some of the most beautiful plants our gardens possess. The Carnation, Picotee, Pink, and Sweet

William belong to it. They are most attractive and popular flowers, extremely variegated in their rich colors; very pretty in masses or beds. *Dianthus Sinensis* or *Chinensis* is generally treated as an annual in the plains, though a perennial. *D. Laciniatus* has flowers of various colors, and should be sown along with the former variety in October in the plains, and in April or May in hill localities, in shallow pans well drained, and in a compost of light rich soil.

When they are strong enough transplant them in masses in beds, or in pots, one, two or three in each pot, according to the size of the pot.

D. Heddewigi has very large flowers three to four inches in diameter, and should be sown in the same manner as the former. These are splendid flowers and profuse bloomers, and the plants are compact in habit, as also are plants of *D. Diadematus Plenissimus*, which has large flowers of many colors, of which the petals are curiously marked.

Dianthus Caryophyllus comprises those varieties called Cloves, Carnations and Picotees: most beautiful and fragrant flowers. They do best in hill-stations, and are grown with difficulty in the plains, where they ordinarily do not flower the first year, and before they outlive another year die off. To flower the first year they must be sown early and grown on rapidly.

They also are sown at the same time as other annuals, and the best compost for them, when they are transplanted, is two-thirds of decayed turf loam, one-third old cow dung and some sand.

Lift the plants carefully without breaking the rootlets, and adjust the soil so as to put the plants in their proper position: having first spread out the roots carefully on the soil, and not too low down in the pot, spread some earth over the roots and press the whole down pretty firmly, leaving the soil on a level with the collar of the plant. After this water the pot and place the plants under glass for twenty-four hours.

Picotees are edged with a dark color, or the petals are covered with small colored dots. Gerarde writes, in 1597, of the Carnation, that it was received from Poland, and was remarkably improved by cultivation, and the varieties "were called Flakes, Bizarres, Picotees—pink purple, scarlet and crimson, bearing scarcely any resemblance to the original." Propagation by pipings is executed by pulling out a portion of a branch by holding the grass above a joint and thus severing it. This should then be put under glass till rooted. *Layering* is executed by cutting off the leaves with a sharp penknife, except five or six at the top, and then make a long incision half through the shoot with an upward cut: after which bend it down into some sandy soil prepared for it and peg it down so as to keep the slit open; after a few days, when the wound has had time to heal, begin watering. *Cuttings* may be treated as pipings. Preparatory to gathering *seed*, the flowers, after they have nearly quite dried up, should have the petals pulled off the seed-vessels.

Layers of Carnations and Picotees should be taken when they begin to form fibre, and when they are re-potted (both in the plains and cooler localities) in October, prune off all old leaves to within half an inch of the soil and cut off all laterals over an inch long, and these may be struck under glass.

I here quote from a popular writer on this subject the differences between Carnations and Picotees, which he aptly describes as follows:—"The color of the former is disposed in unequal stripes, going from the centre to the outer edge; that of the Picotee is disposed on the outer edges of the petals, radiating inwards and uniformly disposed. Flakes are Carnations of two colors only, with large stripes going quite through their petals. Bizarres have their colors in variegated irregular spots and stripes." When a Carnation is perfect it should be not less than two-and-a-half inches in diameter. The lower petals should be six in number, broad,

thick, smooth, laying over one another, and each row of petals a little smaller than that just under it, and thus rising to form half a ball. All colors should be distinctly and clearly defined, and if there are two colors the contrast must be bold: without all these requirements a Carnation cannot be perfect. The greatest care is used in preparing Carnations for exhibition. The calyx is tied round the middle to prevent its splitting down, as is frequently the case. This is done just when the bud is opening at the top, and then the five pieces which form the outer leaves of the calyx are pulled back down to where it is tied. By this means the petals are properly developed. Then the petals are "dressed," that is to say, placed in their proper positions, which require great nicety, and it is performed by passing the threads of the broadest petals outside of the smaller ones, and guiding the others to the centre, the largest being kept outside and the smaller ones in regular circles overlapping each other; the tier above it in succession being smaller than the one below; the third row of petals is so placed as to be on the joinings of the second, and the fourth row on the joinings of the third, and so on: thus, as the bud grows and expands, this artificial disposition of the petals, which is performed with smooth flat ivory tweezers, gives quite a natural effect to the appearance of the flower.

The whole then is supported by a card which has a hole cut in it so as to admit the calyx up to where it was tied, and the petals fall on, and are supported by the card, which is cut circular in shape, to correspond with the flower, and to be hidden by it as much as possible.

Dianthus when in bud are all the better of watering with liquid manure. Some very nice introductions have been made lately—Japanese Pinks, Snowflake and Crimson King. The Bride, white, with a dark spot of violet color. Very floriferous, large single flowers.

Pink new Cyclops, clove scented, large single flowers of many colors.

Pink Guilland flowers the first year, and in this respect is like the *Marguarite Carnation*, but having a considerable amount of carnation strain in them: a large percentage with yellow coloring in them, which *Carnation Marguarite* has not. Very fragrant.

Carnation Marguarite giant, of many colors. This is quite a boon to the plains garden, as they flower the first year. Very fragrant and in all respects like *Carnation Marguarite dwarf*, except that the plants are taller. The seed of all the above varieties may be obtained from the Himalayan Seed Stores, Mussoorie, N.-W. P.

DICENTRA OR DIELYTRA.

Nat. ord., Fumariaceæ.

Very pretty little plants for pot culture in the hills. In the plains in the North-West Provinces they do, put down in November in a sheltered position in shade in a pot. The roots are fleshy and may be got from seedsmen. The Himalayan Seed Stores, Mussoorie, North-West Provinces, can supply them.

1. *D. Spectabilis* is the best known and a very pretty species, bearing pretty locket or heart-shaped flowers, rosy crimson and nearly an inch long. The plant is sometimes called the bleeding heart. Height about 9 inches to 2 feet.

2. *D. Thalictrifolia*, flowers yellow, with reddish mouth, fragrant, large, oblong and flattish, dilated into two horns at the base.

3. *D. Eximia*, flowers bright reddish-purple, drooping, oblong: racemes compound.

4. *D. Formosa*, bright red flowers, broadly ovate. The last three species are not so well known in India. These plants, after they have flowered, should be allowed in autumn to die down, and should be started again in spring. The roots, however, should not be allowed to grow dust dry.

DICERMA.

See *Desmodium*.

DICHORISANDRA.—*(Foliage and flower.)*

Nat. ord., Commelyaceæ.

These are plants of prostrate habit of growth with ornamental leaves, and some having handsome flowers. *D. Ovata*, green shot purple leaves, ovate lanceolate; the stems being pea green barred with olive green. *D. Undata*, leaves dark green with longitudinal bands of green reflected with silver, and of green shaded to black. The under portion of the leaf purple. The leaves are waved. *D. Musaica*, flowers azure blue, in spikes; leaves ovate acute, deep green, and pencilled with wave-like lines of white, and purple of a reddish tint below. Stems chequered. *D. Vittata* is a new introduction. There are many others well worthy of introduction, such as *D. Albo Marginata*, *D. Leucophthalmus*, *D. Oxypetala*, *D. Picta*, *D. Sandersii*, *D. Thyrsiflora*.

DICKSONIA.

See *Ferns*.

DIEFFENBACHIAS.—*(Ornamental foliage.)*

Nat. ord., Aroidacea.

An extensive genus of plants which have of late years risen in popularity, and justly so, as they are among the most beautiful foliage plants we possess. There are now in cultivation an immense variety of these plants. The climate of the plains of this country seems to suit them admirably. They delight in a rich open soil, to which add old cow-dung and sand, and like all plants I may say they must be carefully drained. It is also necessary to give them partial shade, to insure success in the fullest sense, though they are hardy plants and easily propagated. Admirably suited to grass plant-houses in the plains, but not to the hills unless under glass.

Unlike other Aroids, they produce their leaves on a single stem such as Dracænas; seldom, if ever, except in the case of very old plants, throwing out branches. When they attain age they become unsightly, owing to the bare stem giving them a scraggy appearance. If the plants be of a moderate size, the method of propagation should be followed out by cutting off the top, below, or just at the first mature joint, and placing the same under a glass, keeping it close, when it will root freely.

The pot with the remaining old stem may then be tilted and allowed to remain thus, till the plant has thrown out side shoots, which in their turn may be each taken off with a small portion of the old stem and planted in pots and kept close under glass, when they will form fine young plants.

Another method is that of taking off about half an inch of bark in a ring round the stem, cutting a pot in half and placing it round the stem, enclosing the portion where the bark has been removed, and filling up the pot with a good light soil, keeping it constantly moist, and taking care that the pot is supported by stakes on at least two sides to prevent the plant breaking off.

After a month, the pot should have a sufficiency of roots in it to enable the removal of the upper portion by cutting off the stem, just below the incision which is in the pot. The remaining portion of the old stem may be treated as before mentioned, or it may be cut in pieces of one eye each, and planting them in sand under glass, which should be kept close. Thus a great number of plants may be propagated.

It is indeed difficult to give a choice list of these plants, for they are all handsome and noble plants, taking a primary rank among ornamental foliage plants.

1. *D. Amœna.*—Leaves deep green, oblong ovate, marked with elongated spots of white and pale yellow in

profusion, which can also be seen on the lower side of the leaf.

2. *D. Bausei.*—With leaves 2 feet long by 10 broad, dark green, spotted with large spots of pale green.

3. *D. Chelsoni.*—Deep velvetty green leaves, the costas of which are marked with a grey band running out into a feathery edge, extends about a third across each blade, the surface of which is spotted with irregular-formed blotches, which are bright yellowish green for two-thirds of its breadth.

4. *D. Costata.*—Leaves ovate, blunt at the base, undulating at the edge, acuminate at the apex. Of a deep velvetty green with ivory white midrib, and blotches of the same color of an oblong form over the entire leaf.

5. *D. Delecta.*—Leaves elliptic, lanceolate, of a green satiny surface, spotted with white variegations. The stem of this variety is also mottled.

6. *D. Jenmanii.*—A new species named after the discoverer, who found it at George Town. Leaves bright, glossy green, with a pure white band at every lateral nerve, and white spots between the bands. Both bands and spots are semi-transparent, so that they are seen on both sides of the leaf.

7. *D. Leopoldi.*—The leaves of which are a dark shining green, the rib of which is ivory white, bordered through the whole length with a whitish band. The form of the leaves oblong ovate.

8. *D. Marmorata.*—Leaves ovate, light green, spotted and dashed with white, and are of a thick texture; about two feet long by six inches broad.

9. *D. Majestica.*—Majestic, as its name implies: its leaves are of a dark green, boldly marked with bright yellow blotches, and a feathery bar of white down the centre. Form of leaves oblong ovate, tapering to a point; a foot in length by six inches in breadth.

10. *D. Magnifica.*—As its name implies, magnificent. A native of Venezulla. Of stocky habit. Leaves dark green, ovate, acuminate, 12 to 15 inches long by 4 to 5 inches broad; boldly marked with large irregular blotches of pale yellow.

11. *D. Princeps.*—Leaves dark green with a silver grey marking through the centre and scattered yellow spots over the entire surface. Form of leaf slightly oblique, the narrower side cordate.

12. *D. Regina.*—Leaves greenish white, mottled paler green into a narrow margin, and a few streaks of a darker shade. The upper portion of the leaf of a palid hue. Form of leaf oblong elliptic, rounded at the foot, shortly acuminate. One of the finest Dieffenbachias.

13. *D. Rex.*—Leaves closely placed on the stem, leaf blades unequal sided, elliptic lanceolate. Deep green in the centre, lighter at the edges of the narrower side, blotched to within half-an-inch of the margin with oblique, elongate and angular spots of white running the same direction as the veins; these again are veined with green. This is probably the finest of Dieffenbachias.

14. *D. Triumphans.*—Leaves ovate, lanceolate, dark green, blotched with irregular angular light green markings, thickly interspersed over the entire surface, and seen on both sides of the leaves, which are about 14 inches long by 5 broad.

In addition to these may be added *D. Lanceola, D. Maculosa, D. Nebulosa, D. Nitida, D. Nobilis, D. Pearcei, D. Picta, D. Shuttleworthii, D. Splendens, D. Superbiens, D. Rittata, D. Velutina, D. Weirisuperba.*

DIGITALIS.—*(Foxglove. Hardy perennial for hill-stations.)*

Nat. ord., Scrophularinæ.

Very handsome plants, of stately growth. They do not succeed well in the plains, but in hill-stations they will thrive in almost any soil and situation without any particular care.

Quite a novelty is *D. Monstrosa*, which bears one monstrously large flower on the top of the spike bearing all the other flowers. Propagated by seed.

DILLENIA.

Nat. ord., Dilleniaceæ.

Of *Dillenias*, only one is generally known well to our gardens in India, namely, *D. Speciosa*, which is a handsome tree, with noble bright light green leaves, elliptic-oblong, serrated, 6 inches to a foot long. The tree is a large one, often growing to 30 feet and over, and bears white very fragrant flowers, 9 inches in diameter, with yellow stamens, followed by a round green fruit, the size of a pumelo or larger. Propagated by seed. *D. Scabrella*, yellow, Assam and Sylhet. *D. Pentagyna*, yellow, India.

DIPLADENIA.—*(Climbers.)*

Nat. ord., Apocynaceæ.

These are climbers of great beauty, which are successfully grown in plant houses. They require a soil to resemble peat broken up with silver sand, and the drainage must be perfect, so as never to be water-logged. Propagated by cuttings. *D. Amabilis* bears very large flowers, rosy crimson, in large clusters. *D. Amœna*, pink suffused rose. *D. Boliviensis*, white with yellow throat. *D. Brearleyana*, pink, changing to deepest crimson, one of the best. *D. Hybrida*, flaming crimson. *D. Insiquis*, rosy purple. *D. Magnifica*, *D. Ornata*, *D. Regina* have all been introduced to the Calcutta gardens. *D. Carissima* is a lovely large-flowered variety of a soft blush pink. Its flowers are 5 inches in diameter.

DIPLOTHEMIUM.

Nat. ord., Palmeæ.

Plants almost stemless, sometimes quite stemless These are noble palms of late introduction, admirably adapted to

pot culture. The compost best suited to them is peat, in place of which use turfy loam, chopped cocoanut fibre, sand, charcoal and pieces of mortar. Propagated by seed.

The variety in cultivation in this country is *D. Maratimum.* The leaves are more ovate in outline than that of the following variety, pinnate, and the pinnæ closer together, and not more than 10 to 12 inches in length and one inch broad, of a deep green above and silvery green below.

D. Candescens.—Leaves pinnate, 2 feet to 6 feet in length; pinnæ 1½ to 2 feet long and 1 inch broad (divided), bifid at the point and inclined to cluster together. Shining green above, silver green below.

DIPTERACANTHUS.

Nat. ord., Acanthaceæ.

A pretty prostrate shrub, bearing thimble-formed flowers of a light blue cobalt color, with a white tube, and leaves oval, from 2 to 2¼ inches long. Propagated by cuttings put down in the rains.

DOMBEYA.

Nat. ord., Sterculiaceæ.

These are rather large shrubs, with rather a coarse appearance, all natives of Africa and the Mascarene Islands: very pretty when in flower, from the mass of color produced. Readily propagated by cuttings.

D. Acutangula.—Flowers red or pinkish, in crowded corymbs; leaves smooth, cordate, and palmate (in three lobes). A low tree or shrub.

D. Palmata.—Flowers greenish white, leaves seven-lobed.

D. Cuspidata.—Flowers pinkish, leaves three-lobed.

D. Mastersii.—Flowers white, fragrant; leaves cordate, ovate and velvety.

D. Viburniflora.—White flowers, fragrant, about one inch across in corymbose-heads, 5 inches in diameter; leaves large, three-lobed.

D. Tiliæfolia.—Flowers rose-colored, fragrant; leaves heart-shaped.

DORYANTHES.

Nat. ord., Amaryllidaceæ.

Much like an Aloe, but with narrower leaves, out of which it sends up a straight flowering stem, often 12 to 20 feet high, at the summit of which is a tuft of flowers. The spike, however, is clad with small leaves. They are very handsome plants. Cultivated in the grass conservatory.

D. Excelsa.—Flowers brilliant scarlet, each as large as the common white lily, in a globose head, surrounded by leaflets.

D. Palmeri.—Flowers red, with a white or lighter centre, large, funnel-shaped, in a pyramidal spike 1 to 1½ feet high and 10 to 12 inches broad. Many flowered, and clothed with leafy bracts. A very handsome species. Propagated by suckers, but they take a long time to come into flower.

DORSTENIA.

Nat. ord., Moraceæ.

Rather pretty shrubs: cultivated for their leaves in the grass conservatory, and also in open beds in Bengal. Readily propagated by cuttings put in sand during the rains. *D. Argentea*, silvery leaved, and *D. Braziliensis*, heart-shaped leaves.

DOODIA.

Nat. ord., Filices.

See *Ferns*.

DRACÆNA.—*(Shrub. Ornamental foliage.)*

Nat. ord, Asphodelaceæ.

These are really most unique and lovely ornamental foliage plants, which have risen much in popularity in Europe and in

India, though not to the extent perhaps that they deserve, probably because the newer varieties are not known sufficiently,—and these are of the handsomest, with their beautifully variegated leaves, tinted and striped white, yellow, red, pink, cream colored and green of several shades. A most picturesque family of plants, they are much more easily propagated than it has been supposed, which also may have up to this time retarded many from purchasing them. Add to which, young plants do not shew their variegations at once, and therefore at first look common, but even at this stage their growth is so graceful that in itself the form of the plant recommends itself. What is more lovely than a group of these plants on a lawn, in a conservatory, among a collection of plants, or placed as an ornament on the table or entrance to the house! Also they are hardy : far more so, I should say, than many plants less deserving of notice, and which amateurs labour over. They are admirably adapted to our climate. Some few fine collections may be seen in India, but not many. They, after a time, grow tall and leggy. In such case, they are easily shortened by making a slit in the stem half-way through it at the point you would wish to shorten it to. Cut a pot in half and enclose the cut, filling the pot with a good light soil. Care should be taken to support the pot with stakes sufficiently strong. The top will soon send out roots in the pot, and can then be removed. The stem below may then be cut into pieces three or four inches, and treated as cuttings put in a pan or box and covered with glass, and kept close : these will send out numerous young shoots, which, when three or four inches long, may be cut off each with a small portion of the old wood and planted as cutting again under glass. Again, the root of the Dracæna, which is long and tapering, and is covered with buds, though perhaps not noticeable to the eye, yet these may be cut into lengths of an inch and treated as cutting before-mentioned under glass. These will be found to root most freely : more so than cuttings from the stem

above ground; only plants thus raised take longer to exhibit their variegations, but they make the strongest specimens, which recommends this mode of operation. I append a list of some really fine varieties, though there are far too many to give an entire descriptive list of in this work on gardening.

1. *D. Amabilis.*—Leaves long lanceolate, light green, freely marbled, and streaked with white and pink. Very hardy.

2. *D. Anæctochilus.*—A handsome variety. Leaves broadly ovate, acuminate, of a deep olive green, prettily marbled with gold, and a central band of the same color. Young leaves bright green A native of the Amazon Valley.

3. *D. Baptistii.*—Leaves green margined, and stem white and pink. This variety has spreading foliage of a fine form, which is beautiful.

4. *D. Barronii* – Leaves oblong, of dark bronzy green, edged irregularly with a magenta color Young leaves of a lighter color.

5. *D. Bausei.*—A very highly colored and most effective variety, one of the best in cultivation, and of free growth. Leaves re-curved, oblong, elliptic, about 4 inches broad and 15 in length, closely overlaying each other, of a dark bronzy hue, margined crimson, narrow in the lower leaves and broader and more developed in the upper ones; the youngest; and uppermost broadly and brilliantly edged with deep rose. The margins of the leaf stalks are also colored richly. A most desirably ornamental variety.

6. *D. Broomfieldii.*—Of new introduction by S. P. Chatterjee. One of the most magnificent of ornamental foliage plants, and unique in character. A native of North Africa; it rivals its associate *D. Goldena.* A plant of erect slender habit, with lanceolate leaves 1½ inches wide, tapering to a point, drooping, and re-curved; light green, beautifully striped and margined ivory white.

7. *D. Duke of Connaught.*—Leaves closely set, 15 to 18 inches long by 3 broad, of a bronzy green. The marking on the young leaves rosy carmine, changing as they grow older to deep crimson.

8 *D. Earl of Derby.*—Leaves 14 to 18 inches long by 4 to 5 broad, re-curved, oblong, bright green, margined rosy crimson The young leaves are often entirely of the latter color, while the leaf stalks are also tinted with the same color.

9 *D. Duffii.*—One of the handsomest of this genus, of recent introduction from Australia. Of dwarf habit, with broad erect leaves, a foot long by 3 inches broad, bronzy purple. Stem and petioles rich crimson.

10. *D. Elizabethæ.*—Closely clad with leaves, which are dark green, with a narrow crimson edge, the younger leaves having a band of rosy pink and white or cream color.

11. *D. Elegantissima.*—Leaves of a metallic color, margined crimson, which in the younger leaves is much lighter.

12. *D. Goldieana.*—This most distinct and beautiful variety has been introduced from Africa, and is of erect habit; the stem closely set with spreading leaves, the petioles of which are grey, terete with a narrow furrow on the upper side, the base being dilated and spreading with the stem. Leaves having a yellowish-green costa and banded with dark-green and silver-grey in alternate bands equally distributed. Lower side of the leaf purplish-green.

13. *D. Gladstonei.*—Leaves re-curved, 3 or 4 inches broad, bronzy color; young leaves deep crimson and salmon-rose.

14. *D. Hendersonii.*—Leaves light-green, marbled and striped pink and yellow, about 1 to 2 feet long, and 3 to 5 inches broad.

15. *D. Lindeni.*—Nearly as good, if not as good as *Goldieana* or *Broomfieldii.* Leaves arranged irregularly,

clasping the stem deeply at the base, and are lanceolate acuminate, margined white and rose, and abundantly traversed with regular bands of white and pale yellow, shaded and mixed with zones of green. A most pleasing intermixture and blending of colors.

16. *D. Mrs. C. J. Freake.*—Very distinct. Leaves bottle-green: in form lanceolate acuminate, re-curved. Older leaves edged with a narrow line of bright rosy purple, the younger ones with a like line of rosy purple, within which a broader line of creamy white, the extreme margin rosy magenta. The foot stalks of the leaves are margined with pink. A very desirable variety.

17. *D. Mrs. Bause.*—Of moderate growth and dense habit, and of wonderful coloring. Leaves bronzy green, margined and striped deep crimson. The upper and young leaves frequently entirely rosy crimson. This variety seldom grows more than 18 inches high, and has leaves 9 to 12 inches long by 2 broad.

18. *D. Mrs. Hoskins.*—Of moderate growth and distinct habit; the leaves being closely set, are about 12 inches long by 3 or 4 broad, light bronzy purple, a beautiful coloration, and most effective for decoration or exhibition.

19. *D. Mrs. Turner.*—Leaves pale green, with a bright centre spreading towards the margin. Old leaves edged with pink, are about 15 to 18 inches long by 4 broad.

20. *D. Thomsonii.*—Very handsome. Leaves broad, oblong, shortly acuminate, deep green, bordered with an inch wide of pale magenta rose, and a flush of magenta in the centre, deepening with age.

21. *D. Triumphans.*—Of slender habit, erect growth, and a free grower; has leaves elongate, narrow, and of a deep bronzy color, thinly edged with crimson.

22. *D. Voluta.*—A very distinct variety and a hybrid of pyramidal habit, or the base of the plant is wider than

the apex. Leaves are of a stout texture, volutely re-curved in a curious and remarkable degree, of a dark bottle-green, edged purple, the young leaves being white, with rosy variegations and with the leaf-stalks colored white. A plant of free growth and wonderful coloring.

There are, besides these, *Dracænas-ferrea, gracilis, Frederici, Imperator insegnis, Nitzchernii, Picturata, placida, Princess Margaret, Regalis, Stella, Rex, Superba, Salmonea, Sidneyi, Tellingi, Terminalis alba, Venosa, Verginalis, Youngii* and several others; all well worthy a place in the garden, or collection of this lovely and picturesque genus of plants.

DRACOCEPHALUM.—*(Dragon's Head.)*

Nat. ord., Labiatæ.

D. Moldavica.—A small annual, with blue flowers with a wide throat, in whorls, in long racemes. Requires to be grown in patches to be effective. Sow in October in the plains and March in the hills.

D. Canariense (Balm of Gilead).—The leaves, when bruised, are fragrant. This plant is quite insignificant and requires much care in the plains during the rains. In the hills it is easily grown from seed sown almost at any time.

DRIMIA.—*(Pot plant. Ornamental foliage.)*

Nat. ord., Liliaceæ.

D. Revoluta.—A pot plant, the leaves being spotted with white. It bears small pink flowers on spikes. The compost for it should be of a light sandy nature, well drained.

DRYMOPHLŒUS.

Nat. ord., Palmæa.

A genus of about a dozen palms, which are unarmed, with slender ringed trunks. Leaves terminal and pinnasected. *D. Olivæformis*, so called on account of its olive-shaped fruit. *D Singaporensis*, of drooping habit. *D. Ceramensis. D. Rumphii.*

DURANTA.—*(Shrub.)*

Nat. ord., Verbenaceæ.

D. Plumieri and *D. Ellisii* are much alike; the former bearing blue and the latter white flowers at all seasons. Both are large, thorny, rather wide-spreading, but handsome shrubs. They grow in any soil, and are exceedingly hardy, making about the best hedges we have in this country: impenetrable when cut closely. The flowers are succeeded by yellow amber-like berries borne in bunches. The foliage is of a bright green, and very pretty throughout the year. Propagated by seed or by cuttings which take readily during the rains.

DRYMONIA.

Nat. ord., Gesneraceæ.

Prostrate shrubs and climbers, which bear bell-formed flowers on short axillary peduncles. They thrive in a light soil in which leaf-mould is incorporated pretty freely. Propagated by cutting put down in sand. *D. Marmorata:* flowers creamy white and fringed. Leaves dark-green and grey between the veins, under surface purplish. *D. Turialvæ:* flowers white, large and pendulous; lower lobe toothed and lip-like; calyx dull red. Leaves broadly ovate, of a lovely metallic shade. *D. Bicolor* and *D. Punctata.*

ECCREMOCARPUS.

Nat. ord., Bignoniaceæ.

Very elegant and beautiful slender climbers, bearing tubular flowers divided into five equal lobes. Leaves opposite bipinnasected, terminating in a tendril. Stems shrubby and altogether pleasing. They do best in a light rich soil in the hills, but not in the open in the plains. Perhaps they might be grown successfully in a plant house, but I have not seen them grown in the plains. *E. Longiflorus*, flowers yellow, with a green limb. *E. Scaber*, flowers scarlet or deep orange. Propagated by seed sown in March.

ECHINOCACTUS.—*(Hedgehog Cactus.)*

Nat. ord., Cacteæ.

Grotesque-looking plants, ovid or globose, leafless and ribbed, succulent, beset with many thorns. They generally flower from the fascicles of spines on the ribs.

There are about 200 forms described. For culture, see *Cereus:*

Among those cultivated in India are *E. Berlandieri*, *E. Canocanthus*, and *E. Wislezii* at the Agri-Horticultural Society's Gardens, Alipur. Other good varieties are *E. Crispatus*, *E. Hanii*, *E. Hexaedrophorus*, *E. Contei*, *E. Obvallatus*, *E. Pectiniferus*, *E. Pentlandi*, *E. Rhodophthalmus*, *E. Texensis*, *E. Visnaga.*

ECHINOPSIS.—*(Cactus.)*

Nat. ord., Cacteæ. (Now placed among Cereus.)

This too, as its name implies, is a hedgehog Cactus. For cultivation, see *Cereus. E. Cristata purpurea*, *E. Capylacantha*, *E. Decaisneanus*, *E. Eyriesii*, *E. Glaucus*, *E. Formosum*, *E. Pentlandi longispinus*, *E. Multiplex*, *E. Oxygonus.*

ECHITES.—*(Creeper.)*

Nat. ord., Apocynaceæ.

E. Caryophyllata (clove-scented creeper).—An extensive creeper, with thick, leathery, glossy, green leaves. Flowers white and star-formed, with their petals curiously twisted, and fragrant blossoms. *E. Lisianthiflora* has larger flowers, and is of more erect growth. Propagated by seed or by layerings. *E. Cymosa* and *E. Picta* have ornamental foliage, and are smaller climbers than the two before-mentioned varieties. *E. Nutans* is a very handsome small creeper, leaves veined with a transparent red. *E. Rubiovenosa* is also a handsome variety, covered with a brilliant net-work, speckled red or yellow, on a bright emerald green. They grow in any ordinary good soil.

ECHIUM.—*(Vipers Bugloss.)*

Nat. ord., Borragineæ.

Plants with coarse foliage, not much grown in India. There are about twenty species, which can be grown from seed sown at the same time as annuals. Most of them have blue flowers, while a few are rosy or purplish.

ENCEPHALARTOS.

Nat. ord., Cycadaceæ.

Very handsome plants, allied to *Cycas*. Increased by seeds. Treated in the same manner as *Cycas*. Water copiously when in growth, and syringe, but when not making new growth little water is necessary. Their leaves are pinnate, thick, spiny and terminal. The best compost for them is strong loamy soil, to which add sand. *E. Brachyphyllus, Caffra-Lehmanii, Villosus, Altensteinii, A. Vromii, Hildebrandii, Horidus, Lanugicosus, Ghellickii, M'Kenii plumosus.*

EPACRIS.—*(Pot-plant, for hill-stations.)*

Nat. ord., Epacrideæ.

These plants much resemble heaths, and bear very handsome flowers. They are natives of Holland, and I doubt, if even with protection from severe heat and careful management, they would grow at all in the cooler portions of the plains, but they will thrive in hill localities. They are grown best in a soil of peat, sand, and charcoal, coarsely pounded: if peat is not procurable, then use old turfs, pulled to bits, and mixed with cocoanut fibre, sand, charcoal, and old cow-dung. The pots must be well drained; yet the plants must never suffer from want of moisture, and must have plenty of air and light, and just sufficient heat to keep them from frost.

They should be well cut back after flowering, and when they have grown a little, re-pot them, and place them under glass in a cold frame; then after a few weeks expose them,

and if their wood is hardened by September, they may be placed in the conservatory or verandah, where they will yield an immense profusion of splendid blooms in succession, their flowers being like tubes, of most beautiful colors, some exceedingly brilliant, others delicate, and all having a more or less wax-like appearance. There are a great variety of them, all beautiful. Cuttings may easily be struck in sand under glass.

EPIDENDRUM.—*(Orchidaceæ.)*

See *Orchids.*

EPIPHYLLUM.—*(Pot-plant. Centipede Cactus.)*

Nat. ord., Cactaceæ.

Epiphyllum Truncatum is a delicate and fragile plant of the Catus tribe, and bears in the cold season large red flowers. It should be carefully protected from wind, as it is easily blown to bits. They require small pots, 4 or 5 inches in diameter, which should be placed in larger ones filled with gravel, or a small trellis-work should be placed round the plant on a level with the pot to support its branches and prevent them from being injured, as well as to prevent the pot from being blown over. It should be kept in partial shade. A small piece broken off will take root. The soil they are grown in should be sandy, with vegetable mould added to it (see *Cerus*). *E. Russellianum*, rose-colored flowers. *E. Coccineum*, scarlet flowers. *E. Spectabilis*, white and purple, and several others.

EPIPREMNUM.

Nat. ord., Aroidaea. (Araceæ.)

Epipremnum are pretty trained up trees to which they cling. Their leaves are large and pinnasect, partly divided, much resembling those of the *Monstera.*

E. Mirabile, the Tonga plant. For culture, see *Monstera.*

ERANTHEMUM.—*(Plant and Shrub.)*

Nat. ord., Acanthaceæ.

These plants bear flowers of various colors. *E. Erectum* bears blue flowers, as also does *E. Strictum*, which has larger leaves. *E. Bicolor* and *E. Crenulatum* bear white flowers; the latter having a puce spot in the centre, and the former with puce pencilling marks. *E. Nervosum* has azure blue flowers, and *E. Racemosum*, pink flowers. Propagated by layerings or cuttings. They grow in any rich garden soil with an admixture of leaf-mould. *E. Grandiflorum*, pale blue. *E. Cinnabaricum*, reddish pink. *E. Pulchellum*, rich blue. *E. Tuberculatum*, pure white.

ERICA.—*(Pot-plant. Heath.)*

Nat. ord., Ericaceæ.

A genus of plants mostly natives of the Cape of Good Hope. There are said to be five or six hundred described species, and ever so many more produced by cultivation. They are valuable for conservatory purposes, as the different varieties flower at different seasons, so that they may adorn the conservatory almost all the year round. They have been propagated by seed, and have flowered in this country in the plains, but with difficulty. The soil they grow in best is the soil in which the wild heath grows, but if that is not obtainable, the same sort of compost as is recommended for *Epacris* will do. They must be occasionally transplanted, and in so doing care must be taken that the soil round them is well pressed down. *Ericas* are propagated by cuttings, an inch or two long, made of the young top shoots of the plants. Avoid bruising the stems, and put them in clear silver sand under glass so as to completely exclude air, and only take up the glass to wipe off the moisture occasionally. Heaths are divided into spring-flower, summer-flowering, and autumn and winter-flowering varieties. To enumerate the varieties would be simply absurd, they are so

numerous; and all of them, without exception, are beautiful. They vary much in height, from 2 inches to 2½ feet high. There is always a good deal of difficulty in growing and flowering these plants in the plains, though they will succeed well in hill localities.

ERIOCOCOS.

Nat. ord., Euphorbiaceæ.

These plants are more curious than pretty, bearing minute flowers along the edges of their leaves on hair-like stems. *E. Glaucescens.*

ERODIUM.—*(The wild Geranium. Pot-plant. Hardy perennial.)*

Nat. ord., Geraniaceæ.

Erodium pelargoniæflorum.—A beautiful little plant, bearing white and rose-colored flowers, very prettily striped. It succeeds in almost any soil enriched with leaf-mould.

ERYSIMUM.—*(Yellow Stock or Hedge Mustard. Annual.)*

Nat. ord., Cruciferæ.

Like large showy orange or yellow heads of wall flowers. Sow in the border or in pans, in October in the plains, and in spring in hill localities, and transplant in borders or ribbons. They succeed in a light rich soil.

E. Perofskianum: orange, 1½ feet high, hardy annual.

E. Barbarianum variegatum; yellow, foliage variegated, 1½ feet, hardy perennial.

E. Arkansanum: yellow, 1½ feet high, hardy annual.

ERYTHRINA.—*(The Coral tree. Shrubs suitable for borders in the plains.*

Nat. ord., Leguminosæ.

These are pretty plants, which grow in open borders in the plains, but require shelter in colder localities. They

succeed well in any rich open soil composed of loam, sand, and leaf mould. Propagated by cuttings placed in sand under glass, or from seed. To obtain vigorous growth they should be well watered when growing.

E. Blakei: scarlet.

E. Crista Galli: crimson; from Brazil, called the Cockscomb flower.

E. Hendersoni: scarlet.

E. Indica: brilliant scarlet; flowers in a leafless condition.

E. Corallodendron: scarlet: from West Indies.

E. Laurifolia: scarlet.

E. Parcelli: a foliage variety, very pretty.

E. Marmorata: a foliage variety, blotched and spotted white, very handsome.

E. Madame Belanger: flowers dark rich reddish crimson, velvety; and many others.

ERYTHROXYLON.—*(Cocoa.)*

Nat. ord., Lineæ.

A pretty little shrub, with its bright cherry like berries, which it yields in abundance. I have seen it used as a border at the back of a bed with pretty effect. The leaves are medicinal, and are used for making Cocaine. The leaves are used as a masticatory by the South American Indians.

ESCALLONIA.—*(Shrub for hill-stations.)*

Nat. ord., Escalloniaceæ.

E. Macrantha.—Described by Firminger as "a rich green shrub, bearing bright pink fragrant flowers." Propagated by layerings and cuttings. A choice plant.

ESCHSCHOLTZIA—*(Californian Poppy. Hardy annual.)*

Nat. ord., Papaveraceæ.

Very showy profuse flowering plants, and highly ornamental. Their colors are very brilliant. They succeed better

when not transplanted, and, therefore, should be sown where they are to remain, in ribbons, masses, or beds, and should be sown at the same time as other annuals, in October, in the plains.

E. Californica : bright yellow with rich orange centre, 1 foot.

E. Carmina grandiflora : carmine rose.

E. Crocea florepleno : orange-colored double flowers.

E. Mauderin : orange crimson outside, inside rich orange.

EUCALYPTUS.

Nat. ord., Myrtaceæ.

These are lovely trees, good for avenues, but most of them are too large for gardens. They are said to be possessed with the property of clarifying the air and making feverish places healthy, and for this reason have been introduced to many places in this country. The seed of a good many varieties may be got from the Agri-Horticultural Society of India, Alipur, at Re. 1 a packet.

E. Globulus : blue gum.

E. Citriodora : lemon-scented.

E. Rostrata, and others.

EUCHARIDIUM.

Nat. ord., Onagrarieæ.

E. Concinnium.—These are showy little annuals with lilac-purple flowers, not unlike Clarkia. *E. Grandiflorum* is a larger flowering form of the last. Sow the seed in October in the plains and March in the hills, in the border where they are to remain.

EUCHARIS AMAZONICA.—*(Bulbous pot-plant.)*

Nat. ord., Amaryllidaceæ.

These very handsome plants have bulbs much resembling onions, large, polished and dark green. They thrive well in a light loam, leaf-mould and sand, and bear pretty waxy

white flowers. Allow their leaves to die off, from discontinuing watering, by degrees, in the hot weather, and let their bulbs lie in the pot they are in till October, when they should be transplanted and surface-dressed, but not divided. They are propagated by division of the bulbs, which increase rapidly. They are very hardy, and well repay the little care they require. They seem to flower more freely in the Bengal hill-stations than in the hills in the N.-W. Provinces.

E. Elemetiana, E. Candida, E. Grandiflora, E. Mastersii, E. Lowii, E. Pumila, E. Stevensii, E. Saundersii.

The soil best suited to them is two parts rich loam to one of leaf-mould and manure, to which add charcoal. Propagated by division of the bulbs: but it is better when the bulbs are left undisturbed and only surface-dressed when not in flower, for they then seem to flower more freely than when the bulbs are divided, as they must be for propagation.

EUCOMIS.—*(Bulbous pot-plant.)*

Nat. ord., Liliaceæ.

These are curious-flowered plants, bearing flowers on spikes tuft-crowned. They are half-hardy bulbs from the Cape of Good Hope. *E. Punctata* has green and brown flowers, and grows to about 2 feet in height. *E. Striata* and *E. Undulata.*

EUONYMUS.—*(Spindle tree.)*

Nat. ord., Celastrineæ.

E. Japonica is the handsomest species and bears small white flowers with fringed petals in many-flowered panicles. The leaves are oblong, pointed and serrulated. This is a small tree which, when matured, grows to the height of 20 feet.

E. Grandiflorus, E. Fimbriatus: both white-flowered.

E. Atropurpureus: dark purple.

Of the first named species there are some fine varieties with variegated leaves. Propagated by cuttings in the rains.

EULALIA.—*(Properly genus Miscanthus.)*

Nat. ord., Gramineæ.

These plants have linear leaves, lanceolate, about 3 feet in length when well cultivated.

E. Japonica has purplish flowers, in panicles about 10 inches long. Leaves deep green.

E. J. Folis striates: leaves with a cream colored band running through the centre of the length.

E. J. Zebrina: leaves with band across their width.

They are of the easiest culture in any garden soil with leaf-mould and a little manure.

EUPATORIUM.—*(Fragrant shrub and pot-plant.)*

Nat. ord., Compositæ.

E. Odoratum is a pretty shrub, bearing fragrant flowers.

E. Fœnculaceum: a herbaceous plant, bearing lavender colored flowers.

They are not very attractive, and can be grown in any ordinary soil enriched with cow-dung and leaf-mould. Propagated by seed. *E. Ayapana* is a tall tree.

EUPHORBIA.—*(Pot-plant.)*

Nat. ord., Euphorbiaceæ.

These plants grow best in brick rubbish, leaf-mould and charcoal, or sand. Some of these are most charming plants, especially the following varieties, all of which are propagated by cuttings placed in sand in shade.

E. Jacquiniflora or *Fulgens* is one of the finest pot-plants we have. When in flower, in the cold season, it is covered with vermilion colored flowers along the stems. Some time before flowering, the stems should be tied down round the pot, which will induce new shoots to spring up; these too will be covered with blossoms. This is a very desirable method of enhancing the beauty of the plant.

E. Bojeri and *E. Splendens* are not so handsome as the former, yet are pretty plants, bearing their vermilion flowers in the hot season chiefly, though they flower more or less all the year round.

E. Regis jubæ is a pretty variety bearing red flowers. These flowers are much admired, are often worn in the hair, and are as pretty as any that can be obtained for that purpose.

There are a great number of plants of this genus, but not many that are ornamental.

EURYCLES.

Nat. ord., Amaryllideæ.

These are very handsome bulbous plants, allied to *Pancratium*. Their leaves are very broad and cordate. Height about 1 to 2 feet.

E. Amboiensis: flowers white, produced in a many-flowered umbel.

E. Cunningham or Brisbane Lily: flowers white, in umbels less crowded than in *Amboiensis*. They are best planted in a light soil. Propagated by division of the bulbs.

EUSTREPHUS.

Nat. ord., Liliaceæ.

E. Latifolius: a small plant with rather grassy-looking leaves of a feathery effect, for which it is chiefly grown. The flowers are small, pale purple. The stems are weak, flexuose but not climbing, and can be readily trained up a trellis to a considerable height. Propagated by cuttings during the rains.

EUTERPE.

Nat. ord., Palmeæ.

Palms, natives of America and the West Indian Islands. Their leaves fall off completely along with the rest of the leaf, leaving a clean stem up to the base of the next leaf, and

do not leave dried leaves hanging, like many fan palms. They require a rich loamy soil to be grown to perfection.

E. Edulis, E. Montana, E. Oleracea.

EUTOCA.—*(Annual.)*

Nat. ord., Borragineæ.

There are many varieties of Eutoca, most of them being handsome flowering plants. Sow them in the border, where they are to remain, at the same time with other annuals.

E. Multiflora, pink.

E. Viscida, blue.

E. V. Alba Striata, striped.

EXCŒCARIA.

Nat. ord., Euphorbiaceæ.

E. Bicolor, a very handsome shrub with lanceolate levaes, beautifully variegated, 4 to 5 inches long, dark green above and crimson beneath, bearing insignificant flowers. Propagated by cuttings during the rains. *E. Cochin-chinensis* is a later introduction.

FERNS.—*(Ornamental foliage.)*

Nat. ord., Filices.

The different varieties of ferns furnish the most ornamental and beautiful foliage that our conservatories contain. As a rule, they enjoy a moist atmosphere, shade, and a liberal supply of water. The soil they are grown in must be light and porous, absorbing what it can retain, and allowing the remainder to drain off easily. For this purpose, use sand two parts, loam four parts, sawdust or leaf-mould four parts. I have seen ferns thrive very fairly grown in sawdust alone, but the compost first recommended is the best, mixed with crocks or small stones. The bottoms of the pots or cases should be carefully drained with crocks, and a layer of sawdust only,

or cocoanut fibre, put over the drainage. If glass fern cases are used, a little air must be admitted, and it must always be kept in view that a moist atmosphere is maintained by frequently watering and closing the glasses, which should only be opened a little occasionally, when the glass has to be wiped to take off the moisture which may have condensed on it. Many kinds are hardy with us in India, and it has been remarked by experienced cultivators that those ferns found in a temperate climate grow most luxuriantly in a tropical climate, and the varieties which are found wild growing in England thrive best in a stove there. Thus it is said that ferns are "considered to be a remnant of the vegetation of a past era of the earth, and the treatment they require would seem to confirm this view."

All fern cases must be commodious enough to allow of the leaves being drawn up from shade and from the humidity of the atmosphere. Choose dwarf compact ferns which will admit of this, unless your fern case is very large and capable of accommodating the ferns easily, or when you are fortunate enough to possess a plant house. Care should be taken to ventilate to such an extent only as will prevent mouldiness and damp. By placing a few bits of broken rock to produce a natural effect, the fern case or fernery will present a highly attractive appearance. Virgin cork is admirable for forming the inside lining of fern cases, ferneries and grottoes, and may be procured at cheap rates from different firms in Calcutta, Madras, Mussoorie or Bombay, or, if they have not got it in stock, may be procured through them, or obtained at remarkably cheap prices direct from England, from the London & Lisbon Cork-wood Company, 28, Thames Street, London, or any other respectable firm. It is easily fastened by small nails or wire, or stuck on with guttapercha melted by the flame of a lamp or a candle. If ferneries are constructed in an open spot, they must have a grass roofing or blinds over them, so as to protect them from the sun at least three-fourths of the time the sun is up, only allowing the sun to

shine on them in the early morning and late in the evening, if at all, for ferns grow much more luxuriantly quite out of the rays of the sun. Syringe ferns frequently; too much water cannot be used if the drainage is perfect; and of all things, they must not be allowed to have a speck of dust on them.

Mr. Woodrow in his work describes how some of the Maiden-hair ferns are grown in Guneshkhind in a very pretty and simple manner: "A board is covered with a compost of one-half very calcareous soil, one-fourth leaf-mould and one-fourth moss. The compost is laid down about an inch thick; on this the small plants are laid, which are then covered with a layer of moss, and the whole fastened down firmly with wire netting." By this method they may be grown against a wall, and the board may be cut into any shape, or boards may be so put together as to form a pyramid, and a vase filled with water placed above it with a bit of cloth in the water, and hanging on the top of the board. It will answer admirably for watering it. In the same way they may be grown all over the outside of a chatty or a pot and suspended, forming a pretty object in a conservatory or grass house, the chatty or pot being filled with water to keep up the moisture.

Ferns are propagated by division as well as by seed, which may be sown as follows:—Having prepared a pot with the compost generally used as recommended at the beginning of this article, place the pot up to the rim in water till it is thoroughly wet; sow the fern seed thinly in it, and place a glass over it. When the soil begins to get dry, do not water it from the top of the pot, but place the pot in the water again as before-mentioned. Another way is by sowing fern seed on large bits of cork floated on water, with a glass placed over the water, having its edges in it, so as to exclude air; a little compost (which should be almost entirely sand) may be thinly scattered on the cork before sowing the spores. A brick covered with a little soil, on which the spores should

be sown, and then a thin layer of live moss may be placed over it. The brick may then be placed nearly to its surface in water in a pan which should be covered with a hand glass. This is probably as good a way as any. When they have germinated, they should not be watered overhead, and while yet very small should be carefully pricked out and transplanted into suitable mould. The pots should be stood in water when they require watering. A useful hint is that no hairy ferns should be syringed or watered overhead.

As a rule, the more moist the climate, so much more is it suitable to fern culture. Therefore, I should say, Bengal has a much more suitable climate for growing them than the North-West Provinces and Punjab. There is always a certain degree of difficulty in growing fern trees, such as found in the hill district of Darjeeling, as also several of the smaller ferns of cool districts, such as Darjeeling, in the plains; and in such case a small shallow tank, running the full length of the house they are grown in, is indispensable to keep up a humid atmosphere, and frequent application of water and syringing is absolutely necessary, added to which shade.

The dead stem of a fern tree planted in a tub, with ferns growing around in the tub and around the stem, and on its summit, forms an admirable ornament to a fernery.

I should advocate underground ferneries in the dry climates of Upper Bengal, the North-West Provinces, and the Punjab as likely to produce the best results. These should be constructed with a covering of glass, and with a shallow tank running down the full length of its centre, and with fountains where water pressure could be obtained.

Almost all ferns may be increased by division of the roots.

The following is a list of ferns which may be cultivated with success, and which may be obtained from the several Botanical Gardens in India and other sources to adorn ferneries, one of the most beautiful objects in our gardens when properly cared for,

HEMIONITIS and DRYMOGLOSSUM are neither very interesting nor ornamental, their fronds being like ordinary leaves.

GYMONOGRAMMES, or silver and gold ferns, as we call them ordinarily, are very beautiful and valuable to our ferneries, none of which would be complete without them. Their sori arise from the underside of the fronds on the veins, linear or linear-oblong, simple or forked.

*G. Calomelanus** (silver fern), *G. C. Chrysophylla** (gold-leaved, annual), *C. C. Peruviana** (golden), *G. Candiformis*, *G. Chærophylla*, *G. Decomposita* (golden), *G. Ferruginea* (golden) and *G. Lanata* (a variety of the last), *G. Flexuosa*, *G. Hamiltoniana*, *G. Hispida* (golden), *G. Japonica*, *G. Javanica*, *G. Lanceolata*, *G. Lathamiæ* (silver), *G. Leptophylla* (annual), *G. Macrophylla*,* *G. Pearcei* (silver), *G. Pulchella** (silver), *G. Rufa* (golden), *G. Schzophylla*, *G. S. Gloriosa*, *G. Sulphurea* (golden), *G. Tartarea* (silver), *G. Tomentosa* (silver), *G. Triangularis* (powder orange, to white), *G. Trifoliata* (yellow), *G. Ochracea** (silver), *G. Flaveus** (silver), *G. Martensii** (silver), *G. Massonii** (the sweet-scented gold fern), *G. Argyrophylla** (golden).

NOTHOCLÆNA or NOTHOLÆNA.

This genus comprises thirty-four or more species. They should be grown somewhat elevated above the surface of the pot or soil they are placed in. The fronds are better not wetted. The soil they are grown in should be fibrous loam to resemble peat, pieces of sandstone and sand. The drainage must be good and free, as in the case with all ferns.

N. Candida or *Sulphurea*, *N. Eckloniana*,* a lovely variety, *N. Chrysophylla* or *N. Flavus*, *N. Nivea Hookeri*, *N. Lanuginosa*,* *N. Rufa*,* *N. Sinuata*,* *N. Trichomanoides*, *N. Nivea*,* a fine species.

Some of these are bulbiferous. These ferns have a scaly or woolly surface.

*Those marked with an asterisk are varieties commonly seen in this country in cultivation.

POLYPODIUM (including *Aglaomorpha, Calymmodon, Campyloneuron colycis, Phlebodium and others.)*

A most extensive genus. It includes plants of two modes of growth, each of which comprises a number of species and different kinds of venations. It is the largest genus of the order Filices, and comprises 450 species from almost all climates. About Calcutta Firminger mentions the following kinds as growing indigenously :—

P. Poliferum, P. Glabrum, P. Adnascens, and *P. Quercifolium.* And as natives of India :—*P. Wallichii, P. Horsfieldii, P. Lobbianum* and *P. Corronans ;* all "with rod like stripes and fan-shaped palm-like fronds."

I may add other species found in India :—*P. Acrostichoides, P. Adascens, P. Angustatum, P. Argutum, P. Auriculatum, P. Conjugatum, P. Dilatatum, P. Gardneri, P. Himalayense, P. Juglandifolium, P. Lineare, P. Lingua, P. Heteractis, P. Longissimum, P. Nigrescens, P. Obliquatum, P. Phymatodes, P. Propinquum, P. Quercifolium, P. Stigmosum, P. Suburiculatum, P. Trihodes, P. Trifidum,* all of which are natives of India. *P. Vulgare* has many varieties, of which *P. Vulgare pulcherrimum* is the handsomest. *P. Vulgare variegatum* is a variety distinctly striped and spotted with yellow.

CHEILANTHES.

These, like the *Gymnogramma,* are spoken of as silver and gold ferns, from the colors of the paste or ceraceous powder on the lower surface of their fronds. *C. Argentea, C. Rufa, C. Mysurensis,* and *C. Myriophylla* are Indian species, which may be found in the Himalayas and Assam, etc. Other beautiful species of this fern are *C. Clevelandi* (white), *C. Farinosa* (white), *C. Radiata, C. Suaveoleus* or *Fragrans, C. Gracillima,* which is a slender variety with a thick crust of red ceraceous powder. I may note *C. Myriophylla* is said to be an American variety, but *C. Mysurensis* is very like it, and so much so that it would be difficult to separate them.

ADIANTUM.

Adiantum, or maiden's-hair ferns, comprise some of the loveliest ornaments in our fernery. Graceful, delicate and feathery, they are hard to beat in the decoration of ferneries. See, for instance, a mass of *A. Farleyense* growing luxuriantly with its refreshing green: it is at once strikingly beautiful, delicate and refined in aspect.

There are a great number of varieties grown in India and round about Calcutta alone. Mr. H. St. John Jackson mentions in "Firminger" that no less than probably seventy kinds are grown in the Botanical Gardens and some of the large nurseries, which clearly points to their great popularity and utility.

The chief requirements in their cultivation is a compost to resemble peat, fibrous loam and sand; plenty of pot room and good drainage is necessary, especially for the stronger growing sorts.

A. Æmulum, A. Æthopicum, A. Affine, A. Amabile, A. Amœnum, A. Aneitense, A. Bausei, A. Bellum, A. Capilius veneris, A. C. V. Cornubiense, A. C. V. Crispulum, A. C. V. Daphites, A. C. V. Magnificum, A. C. V. Rotundum, A. C. V. Undulatum, A. C. V. Incisum, A. Caudatum, A. Cardiochlæna, A. Colpodes, A. Concinum, A. C. Flemingi, A. Clatum, A. Crenatum, A. Cristatum, A. Cubense, A. Cuneatum, A. Dissectum, A. C. Lawsonianum, A. Mundulum, A. Curvatum, A. Decorum, A. Deltoideum, A. Diaphanum, A. Digitatum, A. Edgworthii, A. Excisum, A. E. Leyi, A. Multifidum, A. Feei, A. Flabellalatum, A. Formosum, A. Fulvum, A. Ghiesbreghti, A. Glaucophyllum, A. Gracillimum, A. Henslovianum, A. Hisidulum, A. Lalhomi, A. Lindeni, A. Lucidum, A. Luddemannianum, A. Lunulalum, A. Macrophyllum, A. Monochlamys, A. Monstrosum, A. Moorei, A. Neoquineense, A. Palmatum, A. Pecottei, A. Pedatum, A. Peruvianum, A. Polyphyllum, A. Princeps, A. Farleyense, A. Reniforme, A. Rubellum, A. Seemanni, A. Tenerum (more or less like *Farleyense*),

A. Tetraphyllum, *A. Tinclum*, *A. Trapeziforme* and its varieties, *A. T. Culturum*, *A. T. Pentadecagon*, *A. T. Sanctæ Cathermæ*, *A. T. S. C. Funcki*, *A. Veitchianum*, *A. Velutinum*, *A. Venustum*, *A. Vellosum*, *A. Williamsii*, one of the most beautiful maiden's-hair ferns, *A. Wilsoni*.

Aspidiums (Shield ferns).

Several of these ferns are hardy, that is, they require a cool climate, and will, therefore, only do in the hills; others are suited to the plains of India.

These are some of the hardy species:—*A. Fœniculaceum* or fennel-leaved (Himalayan), *A. Lonchitis* or holly fern, *A. Falcatum*, *A. Munitum*, *A. Aculatum*. Tropical varieties or those that will grow in the plains are:—*A. Mabile*, *A. Angulare* —will do in the plains or hills—as also *A. Auculatum*, a fern that is found almost all over the world, of which *A. Grandiceps* is a good variety; *A. Auriculatum* (Indian), *A. Hookeri*, *A. Laseerpitifolium*, *A. Meniscoides*, *A. Trifoliatum*; *A. Rhizophyllum*—will do in hills or plains—*A. Viveparum*.

Asplenium (Spleenworth ferns).

This is a large and widely-spread genus, which includes ferns that grow both in cold and warm temperatures. Their leaves are sometimes simple, sometimes divided.

Those suited to tropical culture are:—*A. Abscissum*, *A. Adiantum nigrum grandiceps*, a handsome variety and dwarf, *A. Belangeri*, *A. Baptisii*, very handsome, *A. Circinatum*, *A. Fabianum*, *A. Umbroseum*, *A. Ebeneum*, *A. Erosum*, *A. Esculentum*.

A. Cultrifolium, *A. Felix-formina* or Lady fern and its many varieties suit either cool treatment, or can be grown in the plains. Of these varieties *Victoriæ* is most suitable to be grown in the hills or in a temperate climate. *A. Fragrans* and its varieties, especially *Fœnicutaceum*, which is very handsome, are suited to the plains. *A. Nidus* is a handsome variety, with broad plain leaves, undivided, edge entire, veins

fine and parallel, about half an inch apart, rib, as in the variety called *Australasicum*, often black. *A. Radicaus*, a tall species.

In the hills the following species may be grown:—*A. Adiantum negrum*, *A. Attenuatum*, *A. Ceterach* or scale fern, *A. Augustifolium*, *A. Colensoi*, a lovely species, *A. Bulbiferum*, *A. Fontanum*, *A. Trichomanes*, or Maiden's-hair Spleenworth and its varieties, *A. Viride* or green Spleenworth, *A. Spinulosum*, and *A. Thelypteroides*.

ONYCHIUMS.

The fronds of these ferns are decompound multifid and one to three feet high. *O. Auratum*, a native of this country and the Malayan Archipelago, is a handsome variety; also *O. Japonicum*, a native of Nepal, which is cultivated in Calcutta.

ACTINIOPTERIS (or Ray fern)

Is a small genus of handsome ferns with palm-like fronds. Perfect drainage is very necessary in their cultivation, and they thrive in a compost of crocks, charcoal in pieces about the size of a pea, sand, and a small quantity of loam. *A. Radiata* is tufted, and fronds fan palm shaped: this is a miniature fan palm in appearance; as also *A. R. Australis*, a variety of the above, with fewer leaf segments, which are larger. The plant too is larger.

PTERIS.

Pteris is rather a large genus, including almost every kind of division and venation. These are the brake or bracken ferns. *P. Aspericaulis tricolor*, a native of India; *P. Arguta*; *P. Aspericaulis tricolor*, leaves when young are red: when matured, rich deep green with silvery markings, and sides of mid-ribs red; *P. Atrovirens*, *P. Cretica*, *P. Cretica albo lineata*, *P. Elegans*, *P. Flabellata* (fan-shaped), *P. Leptophylla*, *P. Quadrianrita Argyraea*, a handsome variety of *Quadrianrita*, *P. Sagittifolia*, *P. Scabperula*, *P. Semipinnata*, *P. Serrulata* (spider fern), *P. Serrulata tennifolia*.

The above are about the handsomest.

NEPHRODIUM (including *Camptodium*, *Dryopteris*, *Lastrea*, *Plexnemi* and *Sagenia*).

Among the *Nephrodiums* are some beautiful species. This is a large genus of about 300 species. *N. Dissectum*, *N. Deltoideum*, *N. Invisum*, *N. Erythrosorum*, *N. Floridanum*, *N. Sanctum*, *N. Cuspidatum*, *N. Molle* and its varieties, *N. M. Corymbiferrum*, *N. M. Grandiceps*, and *N. Patens cristatum*.

DAVALLIA.

The stems of these ferns are prostrate or creeping, and covered with a down. This genus of ferns comprises about one hundred species. *D. Affinis*, *D. Canariensis* or hare's-foot fern, *D. Dissecta*, *D. Elegans*, *D. Fijensis*, a lovely fern, and its variety *D. F. Plumosa*, *D. Parvula*, a species from Borneo, *D. Pentaphylla*, *D. Pallida*, a very fine drooping plume-like species, *D. Mariesii*, a Japanese variety, *D. Mooreana*, syn. *Pallida*, *D. Pentapylla* and *D. Tyermanii*, a species from the west coast of Africa, have lately been introduced to Calcutta.

ALSOPHILA.

Alsophilas are chiefly tree ferns, most of which are too large for private gardens. *A. Australis* and *A. Cooperia* have been introduced to Calcutta, the former being a native of New Holland, and the latter a native of Queensland: both handsome species.

LYGODIUM (Climbing ferns).

These are readily distinguished by their climbing stems; the fronds, being permanent, interlace each other. The genus comprises about eighteen species. *L. Scandens*, native of China and Ceylon, *L. Circinatum*, syn. *L. Dichotomum* and syn. *Pedatum*, a native of Chusan and Hong-Kong, have been introduced to Calcutta. *L. Japonicum*, *L. Hetradoxum*, *L. Reticulatum*, *L. Venustum*, *L. Volubile*.

GLEICHENIA.

Exquisitely beautiful ferns of about thirty species. Their stems generally creep. *G. Discarpa*, syn. *Hecistophylla*, has been much admired. *G. Dichotoma* and *G. Circinata smivestita* are fine species. *D. Flabellata*, a lovely fern with date palm-like fronds. *G. Flagellaris*, a species from Java and Malay Islands.

BLECHNUMS.

Blechnum, the Greek name for fern. *B. Australe*, *B. Braziliense*, *B. Hastatum*, *B. Nitidum* and *B. Occidentale* are good species. *B. Orientale* is a Himalayan species.

TRICHOMANES (Bristle fern).

Trichomanes, from the Greek words *trichos*, hair, and *manos*, soft, alluding to the nature of fronds, which are most delicate. This genus comprises about one hundred species, almost all suited to grow in warm or temperate climates. They are exquisitely beautiful. They should be grown in shallow pans or boxes, well drained, in cocoanut fibre, a little loam and sand, and about half the amount of potsherd or sandstone. For the creeping species the soil should be raised in a mound and the atmosphere must be humid; they require much watering and syringing. *T. Alatum*, *T. Bancroftii*, *T. Crispum*, *T. Pluma* (creeping species), *T. Javanicum*, syn. *Rhomboideum* (native of India and Java), *T. Trichoideum* (creeping species), *T. Vinosum* (creeping, slender).

DICKSONIA (Tree ferns).

A genus of about forty species of tree ferns, which has been grown in Calcutta with some success, *D. Antarctica* being the species. *D. Assamicum* or the Assam tree fern, syn. *Barometz*, *D. Chrysotricha* (Java).

DOODIA.

These ferns have not been imported to any great extent to this country, species *D. Blechnoides* being the only one

mentioned in "Firminger" as having been imported. *D. Media*, syn. *D. Lunulata* (New Caledonia, Sandwich Islands), *D. Aspera* (temperate Australia).

DRYNARIA, POLYPODIUMS, AGLAMORPHA, &c.

A good many of these are found in the Himalayan range, and is the largest genus of the order, comprising about 450 species. *P. Conjugatum*, *P. Dilatatum*, *P. Himalayense*, *P. Lineare* are all Indian species. They do not grow well in Bengal or the plains of India, and I do not think they are, as a rule, missed among the many handsome ferns that may be grown of greater beauty.

NEPHROLEPSIS (including *Arthropteris* in part).

This is a small genus of about ten species, some of them beautiful and of easy culture. *N. Davallioides-furcans*, *N. Duffi*, fronds about 2 feet and tufted, *N. Pluma*, *N. Cordifolia*, syn. *N. Tuberosa*, a handsome species.

These compose many of the ferns that can be cultivated with success in India. Several of them have been already introduced and are under cultivation now.

FICUS.

Nat. ord., Moraceæ.

Ficus Repens, a pretty creeper with small leaves, which attaches itself to trees or walls it may be grown against, after the fashion of Ivy. I have a variety with leaves edged cream color. Being very hardy it grows in any soil. It grows in the hills as well as in the plains, in which Firminger makes a mistake in saying "they are not met with on the hills," etc.

FILICIUM.—*(Ornamental tree.)*

Nat. ord., Sapindaceæ.

Filicium-decipiens is a handsome fern-like tree, a native of Ceylon, now more common in the Calcutta gardens than it used to be. Propagated by cuttings during the rains and by seed.

FILTONIA.—*(Foliage ornamental.)*

Nat. ord, *Acanthaceæ.*

These are trailing plants with ornamental foliage, very common in Calcutta, but nevertheless very pretty, and suited to shady positions especially, where they thrive with little care in almost any soil, and propagate themselves rapidly.

They are suited to rockeries, and may be employed to fill hanging baskets and basket beds. A little mortar in the soil suits them, particularly during the rains, when their leaves are at their best. Lumps of it should be put in the soil, as well as on it. *F. Gigantea*, *F. Argyronura*, *F. Verchaffeltii.*

FLEMINGIA.—*(Shrub.)*

Nat. ord., *Leguminosæ.*

F. Strobilifera, a shrub bearing small flowers and ovate leaves; also *F. Chappar* with heart-shaped leaves. Both are very pretty when in full blossom. Propagated from seed. They grow in any ordinary garden soil enriched with cow-dung and leaf-mould.

FRANCISCEA.—*(Shrub.)*

Nat. ord., *Scrophulârinæ.*

See *Brunsfelsia.*

FREESIA.—*(Bulbous plants.)*

Nat. ord., *Irideæ.*

These may be readily grown in the plains or hills. In the plains the best time to put down the bulbs is in September and October; and in the hills early in March, or begin growing them with a little bottom heat in December, when they flower in April. A light rich compost is suited to them, chiefly leaf-mould, a little manure, loam and sand. They may be readily grown from seed, but in that case do not always flower the first year. They are best grown in pots. In the hills they

may be planted at different times, to flower in succession. *F. Leichtlinii* bears cream-colored flowers, narrow, funnel-shaped. *F. Refracta*, flowers pure white, sometimes marked with violet lines, and always with orange blotches on the lower segments of the perianth. Very fragrant. *F. Refracta alba*, like the above, very fragrant, and of the same funnel shape, but purest white.

FOURCROYA OR FURCRAEA.

Nat. ord., Amaryllideæ.

Large Agave-looking plants, useful for hedges, or to extract fibre from. They grow readily in any soil and are increased by division.

FRITILLARIA.—*(Bulbous plants for pots and borders, for hill-stations.)*

Nat. ord., Tulipaceæ.

There are many varieties of them, as well as Crown Imperials, which do not succeed well in the plains; but in hill-stations and cool localities they will give every satisfaction if planted in borders, or in pots in a light rich soil, such as suits most bulbs, composed of leaf-mould, loam and sand, with a little cow-dung. They have peculiarly marbled flowers. If they are planted in pots, the drainage must be good. The bulbs should be put down in spring, and protected from frost.

F. Aurea.
F. Armena.
F. Delphiensis.
F. Græca.
F. Lutea.
F. Meleagris.
F. Persica.
F. Pudica.
F. Pallidiflora.
F. Recurva.

FUCHSIAS.—*(Shrub for pots and borders, for hill-stations.)*
Nat. ord., Onagraceæ.

There are few plants more beautiful than a well-grown *Fuchsia*. They are propagated both by seed and by cuttings. If we proceed to cultivate them by cuttings, the following should be the steps adopted to procure plants of handsome form, in perfection. I therefore draw the amateur's *attention to the careful following out of the directions*, he exercising his own judgment and skill in addition. *Fuchsias* thrive well with little care in hill-stations.

Cuttings should be put down in pots of leaf-mould and sand, or peat and sand, in September, from the strongest tops of *Fuchsias* as nearly out of bloom as possible. The cuttings should be about 2 inches long. Press the soil well down about the cuttings, and place them in a situation where the heat will be about 60°. In the hills they grow out of doors—in Darjeeling without any protection, but in Mussoorie and Simla require to be protected—but grow from cuttings put down in the rains quite readily. They will be all the better for being under a bell-glass. In about three or four weeks they will be fit to re-pot in 3-inch pots singly; pinch off all the weakest shoots and keep only one, and that must be the strongest. Plunge the pots into a temperature of from 50° to 60°. They must be shifted again as soon as their roots reach the sides of the pot, until they receive their final shift into 6, 9, or 12-inch pots. When they have reached 8 or 9 inches in height, they will require sticks to support them. Tie them loosely. After they have grown about a foot in height, pinch off the head of the top shoot to induce side shoots. Then fresh shoots will come out after every fresh pair of leaves, and after this, from where the leading shoot was stopped, another will be allowed to spring so as to continue the growth upwards to furnish another foot of laterals, when it will be requisite to stop the leading shoot of the plant again in its upward growth. They may then be

placed in their pots for blooming, which should be, as before mentioned, 6, 9, or 12 inches. If early in the season, 6 or 9-inch pots will do; if later, 9 or 12-inch pots are better. The pyramid form of *Fuchsia* is the best. Occasionally stop the side shoots, and the pyramid will be perfect and bushy. In this the amateur will require to exercise his judgment. A regular temperature of about 60° should be maintained *(not over it at any rate)*. Seeds should never be allowed to form on them. It is best to water them with liquid manure always, which is better than putting manure in the soil. In June, when the sun is powerful, they must be shaded and the pots protected from being blown over, and they should be turned round and round to prevent them being drawn all to one side. At least a month previous to their blooming all pinching off of shoots must be stopped. About two or three weeks before they are exhibited, they should be placed in shade, which will assist them in developing their flowers.

When the plants have done blooming, cut them back a little, and place them in some safe situation. When they begin to spring again, take a few inches of soil off the surface and replace it with fresh compost, and as they grow, re-pot into larger pots. These will form splendid plants, the second season, for early blooming. By these means the finest *Fuchsias* may be obtained both as regards symmetry of form and abundance of flower, as well as richness of color. If you are not particular about the shape of your plant, any cutting put into a pot in the rains will strike readily in the hills.

The latest improvements in this flower are *F. Phenomenal*.

F. Phenomenal, rose ; *F. Phenomenal*, white, which are of huge size and very double. They are the kings of the double varieties.

F. M. E. Vaucher, *F. Avalanche*, *F. La France*, *F. Crepuscule* are also very large.

F. Countess of Aberdeen, a pure white *Fuchsia*, is a lovely small variety.

F. Duke of Connaught, *F. Duke of Edinburgh*, *F. James Hood*, *F. W. B. Leaf*, *F. May Cameron*, *F. W. H. Rowe*, *F. Duke of York*, *F. Marquis of Lorne*, *F. Princess May* are all good new introductions.

FUNKIA.—*(Fibrous-rooted pot-plant.)*

Nat. ord., *Liliaceæ*.

Very handsome small pot-plants with cordate leaves. They bear white fragrant flowers, bell-formed and drooping.

Propagated by division of the roots, which should be as little disturbed as possible, or the plants will not bloom.

The compost used should be light soil enriched chiefly with leaf mould, and well-drained.

In hill-stations, at high elevations, the leaves die off in winter, but the plants should not be interfered with. In spring surface-dress the pots only. Divide the roots only when necessary.

Funkia Sieboldiana has fine foliage and light lilac flowers.

F. Albo Marginata, lilac, striped white and red, drooping funnel-shaped flowers.

F. Medeo-picta, variegated foliage.

F. Fortueni, a lovely variety with light blue flowers.

F. Folio Coerulia is a choice variety of great merit

F. Grandiflora is the commonest variety with sweet-scented flowers, white.

F. Lanceolata, lance-shaped leaves and purplish lilac flowers; and many other varieties.

GAILLARDIA.—*(Annual and perennial.)*

Nat. ord., *Compositæ*.

These are natives of America, and are either hardy or half-hardy annuals and perennials, all splendid bedding

plants, which flower profusely, with brilliant and large-sized blossoms, and continue a long time in bloom. They thrive well in any light rich soil. Sow the seed in October in the plains, either in the open or in shallow pans, and transplant when strong enough. In hill-stations, sow at the same time with annual plants. This flower has been much improved in the variety called *Picta Lorenziana*, which produces large heads of double flowers, and *Gillardia hybrida*.

G. Alba Marginata, white-edged, half-hardy annual 1½ feet.

G. Grandiflora hybrida, crimson and yellow large, flowers, half-hardy annual; 1½ feet.

G. Picta, red and yellow, perennial; 2 feet.

G. Picta, purple centres, petals golden, dashed with crimson, perennial; 1½ feet.

GALTONIA.—*(Hyacinth candicans.)*

Nat. ord., Liliaceæ.

This is one of the finest introductions for many years back. It succeeds in the plains or hills in the open ground or in pots. However, in the plains I would recommend it to be grown in pots in partial shade, such as that of a plant house. Its flowering spikes are about 2½ to 3 feet high, with 15 to 30 flowers of pure white colour. The bulbs are best put down in October in the plains, and may be left undisturbed for years, only giving a surface dressing yearly. In the hills, put the bulbs down at almost any time, but February is probably the best time. In winter, in the hills, it is safest to cover the spot the bulbs are in with a small mound of ashes or old manure.

GARDIENIA.—*(Shrub : fragrant flowers.)*

Nat. ord., Rubiaceæ.

Shrubs from the Cape of Good Hope, China and Japan. They grow in any ordinary rich garden-soil, manured with old cow-dung or stable manure. *G. Lucida*, *G. Florida*,

G. Radicans, G. Latifolia. They bear lovely white flowers, which are fragrant, and their leaves are leathery, of a beautiful glossy green. They are propagated by cuttings. Every garden should have a plant or two of Gardienia; they are pretty, and several have exquisitely fragrant flowers, which are suitable for cut flowers. A lovely variety is *G. Devoneana*, flowers white, scented, and trumpet-shaped. *G. Florida* is the Cape Jessamine. *Gardenia, Florida, Fortueni,* flowers white, scented. *G. Rothmannia* bears yellow flowers. *G. Thunbergia,* white sweet scented flowers. *G. Latifolia,* white sweet scented flowers. *G. Gummifera,* known by natives as "Dikamali." *G. Stanleyana,* purple trumpet-shaped flowers. *G. Lucida,* white. *G. Florida-variegata,* much the same as the type, but with handsome leaves margined creamy white, *G. Radicans major,* a profuse flowerer and larger in all its parts, but smaller than *G. Florida.*

GÁURA.—*(Treated as annual or perennial, pot or border plant.)*

Nat. ord., Onagraceæ.

Very pretty plants bearing large white flowers on spikes. They may be treated as annuals, and sown at the same time, and kept over from year to year if desired. In cold localities they will require to be sheltered from frost, though they will endure extreme heat. They delight in a light soil, and should be frequently watered during the hottest months of the year. The seed may be sown in borders, which I think is the best way of treating it. This plant should be more cultivated than it is.

G. Lindheimeri, white; 1½ feet.

GEISSOMERIA.—*(Shrub for pots.)*

Nat. ord., Acanthaceæ.

Syn. Salpixantha.

These plants have laurel-like leaves which are glabrous or pubescent. There are about ten species in the genus, mostly from Brazil and Guiana, and one from Jamaica. The

flowers are in terminal spikes or paniculate racemes in the form of tubes. They are easily propagated by cuttings put down at the close of the rains in the plains. *G. Aurantiaca*, vermilion. *G. Coccinea*, scarlet. *G. Longiflora*, or long flowered, scarlet, tubular, velvety. These plants grow to about 3 feet in height, and are handsome, especially *G. Longiflora*. They are best grown in shade.

GENTIANA.—*(For hill-stations.)*

Nat. ord., Gentianaceæ.

Gentians are all exceedingly pretty flowering plants which, in cool climates, require no particular care, but will not succeed at all in the plains of India. They do well for edging, and require a light rich soil. Propagated by seed, seldom by division of the roots, except in the case of *G. Acaulis*, blue, with 5 yellow marks inside; a lovely species with very large flowers.

G. Algida, milk white, with blue dots.

G. Kurroo, a lovely intense blue; found wild in Mussoorie. (Kurroo is the native name by which it is known to botanists.)

G. Exacum will grow in the plains, and is pretty; but is never cultivated in gardens. It bears azure blue flowers.

There are many species of Gentian.

GEONOMA.—*(Palms.)*

Nat. ord., Palmeæ.

These palms are of dwarf habit, and are very handsome, with slender smooth stems. They may be grown successfully in a grass plant house, and in a young state are especially adapted to decorate the table. *G. Elegans*, of slender habit. *G. Carderi*, leaves pinnate, strongly ribbed. *G. Gracilis*, leaves pinnate, arching; a graceful species. *G. Princeps*, *G. Pumila*, *G. Schottiana*, *G. Undata* and *G. Seemani* propagated by seed and suckers. They must be grown in

shade, and supplied with water copiously. It is said that if they grow unhealthy the pot should be plunged in a tank, and they will recover if allowed to remain there for a time.

GERANIUMS (VARIEGATED, PELARGONIUMS, ZONALE, FANCY, FRENCH OR SPOTTED GERANIUMS.

(For the plains and hill-stations of India.)

Nat. ord., Geraniaceæ.

These are exquisite floral beauties; nothing can surpass them, though many may equal them, and they are indispensable for in-door as well as out-door decoration; but, as a rule, they do not thrive well in the plains of India, though moderate success will be met with if the amateur follows, the accompanying instructions. Their ornamental foliage and flowers should, however, induce him to cultivate them: and if he has a plant-house, his efforts will meet with at least some reward in the plains. The list attached to this will show what splendid varieties of both flowers and foliage may now be obtained from nurserymen in England, and they are yearly increasing in number as well as beauty, through new varieties produced from hybridising.

Propagation from seed.

I should say propagation by cutting will undoubtedly yield the more certain and satisfactory results in the plains, though they may be propagated by seed procured from any good seedsman (preferably Messrs. Cannell & Sons, Swanley Kent, who make Geraniums a speciality), which germinates well, yet the flowers will not *always* be found true to their names if seed of named varieties is obtained, and greater patience and longer time will be necessary to obtain good, strong, and healthy flowering. Plants, thus raised, will frequently not show their peculiar variegation of foliage the first season. The amateur may therefore think he has obtained inferior seed, but if he keeps the plants a second or third year, they will, when with more wood, show their peculiarities most distinctly, and be

very pleasing varieties. I got seed from England many years ago, when ignorant of this fact, and found the plants appear very common, so rooted them almost all up and threw them away, as occupying too much room; the few left turned out very well the second and third year, showing all that I desired. I would, therefore, recommend caution in destroying these plants when obtained from seed. The seeds of all varieties of Geraniums should be sown in the plains as early after the rains are over as possible, in pots composed of a light soil, chiefly sand and leaf-mould with a little loam added. In sowing the seed, make small holes in the compost, at regular distances in the pot, and in these put one seed with the feathery tail of the feathery tail sticking out; or prick them in this way with a pointed stick. Bury the pots in ashes, or in the soil, to the rim, and draw a curtain over them during the hottest part of the day for five or six hours. Keep the pots moist. When the plants are strong enough prick them out and plant them singly in 3-inch pots in a compost of equal parts of turfy loam, leaf-mould and decomposed cow-dung or stable manure. After this they will be treated as newly-rooted plants from cuttings. In hill-stations sow Geraniums in March in pots, and plunge the pots in a hot-bed; the seed in September or October, and plunge the pots in ashes or a bed where they may be sheltered if desired. I do not think seedsmen from England and the continent supply seed of the best varieties as a rule.

Propagation by cuttings.

The best cuttings are taken from side shoots. They may be procured from hill-stations with a little moss rolled round them: indeed, I do not doubt that they may be got from England in the same way, in these days of rapid transit, packed in moss with wax-cloth round them. I have seen Grape vine cuttings sent out in this way, and they all arrived safely and took well. Both in the plains and in hill-stations, these cuttings should be put down or taken from old acclimatized plants in August, September, and October. They should be

placed in a box, pot, or basket, well-drained and filled with sand and leaf-mould in equal parts, and a little loam. If pots are used, sink them in earth to the rim, and shade them from the sun wherever they are grown. Water then slightly to settle the compost, and take off all extra leaves, leaving only two or three on each shoot of the uppermost leaves. In cold localities only sufficient water should be given to keep them from dying off, and keep the cuttings in conservatories, to protect them from frost and inclement weather. Geranium cuttings strike readily in the hills almost at any time if they are only sheltered from the sun, but not in a closed room. In the plains they can be watered as other cuttings are, as long as there is no fear of frost. In the plains these cuttings will require to be put into pots as soon as they have taken root, which will be seen by their sending up new leaves. In hill localities they should remain just where they were planted till the middle of February, when they must be potted off singly in 4-inch pots. The plants in all the stages of their growth must be turned round in their pots, so that they may not be drawn to one side. They only require shelter from frost.

Imported rooted plants should be turned out of the packages they arrive in, and should be placed in pots with damp compost; and should not be watered till they sprout, and then very sparingly. Let the plants remain in a tub of warm water for a couple of hours at a temperature your hand can bear, and then plant them. During this time they should be first exposed gradually to light, then kept in a shady warm place under glass, or in a slight hot-bed under glass, keeping up a slightly moist atmosphere.

I would advise you to get plants, if you import them, from nurserymen who are large shippers and understand packing plants, such as Messrs. H. Cannell and Sons, Swanley, Kent, or from Messrs. Dobbie and Co., Rothesay, Scotland, and you will not be disappointed. Most nurserymen do not know how to pack plants for exportation, and this means certain failure.

Cuttings struck from acclimatized plants or imported plants should be re-potted as they grow in larger pots; but it is as well to mention that they are better under-potted than over-potted, and flower best when they are pot-bound. The shoots may be staked or tied down to form the plants: this may be done best by pieces of string attached to the rim of the pot, and stakes should be avoided as much as possible. During all the after-management, when they are rooted plants, they should not be subjected to hot-beds (except for a week or two after re-potting each time, then the heat must be very slight) nor allowed excessive sun heat. They may have the tops pinched or rubbed off, to make them bushy and specimen plants, in cool localities, but such treatment is not desirable in the plains, when the best specimens will be obtained from cuttings early put down, and they are required to make the most of their growth up to the end of February or March, after which time they will grow very slowly, if at all. When the hot weather has fairly set in in the plains, they must not be exposed to the sun, but kept sheltered from hot winds. The pots may then with advantage be put in ring pots, and the intercesses filled in with sand. During the rainy weather, too, they must be sheltered from it, and be placed in well drained soil, well pressed down, and only watered so much as to keep them from being dust dry: this is the only means by which they can be kept alive through the rains. In winter, in hill localities, when there is frost and cold weather, they must be very sparingly watered. In watering rooted plants, use liquid manure made from goat's-dung or sheep's-dung once or twice a week, especially when they are flowering; or use the artificial manures as liquid manure which are mentioned in this book.

Young plants never flower so freely as old ones; a plant of eighteen months old will never bear the same number of flowers as one aged four or five years: but they should not be allowed to grow leggy or tall, but should be grown bushy and squat by pinching the shoots.

Your Geraniums should be grown in a soil *rich* in good old leaf-mould, not with any animal manure, or they will grow, and not flower satisfactorily.

Some varieties will grow rather taller than others. No after-treatment will make up for the neglect of early growth in the plains, and flowers will be scarce if early growth is not secured.

I believe from what I have seen that Mr. C. G. Ollenback of Dehra Dun, N.-W. P., has the finest stock of imported plants in India, and they may be got from him. They are grown so easily in the hills that any special directions about them are almost superfluous; it is only necessary to point out how to grow them bushy, and into well-formed plants. Geraniums are now so much improved, especially by Messrs. Cannell, that numbers of varieties have individual flowers 2½ to 3 inches in diameter, in enormous heads, more like hydrangeas than the old varieties.

Below I give a list of very select varieties, some of which may be got from Mr. C. G. Ollenback, Dehra Dun, N.-W. Provinces.

Zonal Geraniums.

The Semi-double Gigantea Section bear enormous flowers in large trusses.

Cousin Bélé, deep salmon shading to white at the margin. *Beauty of Poitevine*, syn. *King of Denmark*, clear salmon. *Enteranthe*, very large flowers and enormous trusses. *Gustav Emich*, clear scarlet. *M. Alphonse Ricard*, rosy scarlet. *M. Briant*, clear scarlet. *M. D. Reydellet*, cerise scarlet. *Mme. Charotte*, trusses 6 to 8 inches across, mottled salmon. *Ville de Poitiers*, light scarlet.

Scarlet and Orange Scarlet.

Golden gate, orange scarlet. *Raspail*, a lovely variety: the finest semi double I have seen; it bears huge trusses in great profusion, deep scarlet, enormous flowers. *Turtle's surprise*,

stems variegated, scarlet flowers, like Raspail. *Golden rain*, orange scarlet. *Gold finder*, orange yellow, tinted scarlet. *Californie*, orange yellow.

Cerise Scarlet.

Mathias Sandof, light cerise, large trusses. *Australian gold*, cerise scarlet, tinted orange. *Mrs. Corden*, soft rosy cerise. *Erl King*, light orange scarlet. *Althea*, rich cerise scarlet. *M. Gelein Lowagie*, large pips and free flowerer.

Reddish Salmon & Pink. *(New class, distinct in color.)*

Renommée Nancéienne, semi-double, rosy-red with white blotch over half of upper petals. *Dr. Mergant*, large white blotch in centre, deep salmon margins. *Illustration*, mottled salmon. *Surprise*, pink, white centre. *Jean D'Arc*, lavender pink, spotted deep pink. *Mme. Vandrey*, soft lavender pink. *Améttenriot*, peach pink. *M. H. Stanley*, deep red pink. *L. Constable, Lord Derby, M. Caro Tendresse, Mme. Barny, Rosa Bonheur.*

Pink suffused Purple.

Mme. de la Rue, intense purple pink, large trusses. *Sir Hamilton Girome, Duc de Mortemart.*

Deep Crimson.

Double Jacoby, Collossus, Rafaël Garreta, Le Congo, Sombre Horizon, Crimson Velvet, Chas. Lalande, Grand Chan Faideherbe.

Purple-colored.

G. Caillebotte, A. Rouillard, Cardinal Lavigerie, magenta. *Edison, Alsace-Lorraine, Boule Noir, General Billot, Aglaia.*

Salmon.

Joyful rainbow, purple and salmon. *Lady Candahar, Diego Podda, Mme. Wellstein*, mottled salmon. *Lord Tennyson,*

fiery salmon. *Mme Jonis Nitida*, very fine. *Ruy Blas*, mottled salmon. *Mme. J. Cause*, *Violet Daniels*, *Miss Flors*, *Maggie Hallock*.

Double White.

The Pearl, *Le Donon*, *Boule de Neige*, *White Abbey*, *Snow-drop*, purest white. *Hermine*, *Mrs. Gladstone*, shaded pink. *Leon Xandrof-Heroine*, *Mme. Leon Dalloy-Rosée*.

The best round flowering Zonal Pelargoniums *(for pot culture specially)*.

Dwarf Double Zonal Pelargoniums.

Wishing gate, rosy pink. *Gone coon*, deep pink. *Miss Bright*, purple scarlet. *Lady Emily Peel*, pink. *Dr. Butler*, salmon. *Le Caméléon*, striped flowers, plant not more than 6 inches high. *Jean Canoot*, blush, very dwarf.

Single Crimson and Scarlet.

King of Crimsons,* bright glowing crimson (a novelty). *Sir Henry Irving*,* soft rosy magenta (a novelty). *Souv. De W. B. Miller*, brilliant crimson, intense, with white eye. *Lord Aberdeen*, brilliant scarlet. *General Wolseley*, clear rosy red. *Iris*, bright purple crimson. *Zenobia*, clear bright rose. *Phyllis*, pale salmon rose, dwarf. *Lord Farrer*,* rosy scarlet, deeper centre, white eye, very large flowers and trusses. *Zenobia*, clear rose. *Trilby*,* cerise, shaded to scarlet, overlaid plum, very rich color, large pips and trusses. *Volcanic*, rich crimson and magenta, bright white eye, immense truss. *Kitty*, soft cherry, white eye, circular form. *Red eagle*, soft scarlet. *Lord Newton*,* bright madder. *Geo. Gordon*, rosy scarlet. *Princess Alix*, pale rose. *Mr. Owen Thomas*,* rich scarlet, tinted crimson, white centre, circular flower. *John Ruskin*, soft orange red, large. *Duke of York*,* reddish magenta, large flowers and trusses. *Lord Elgin*, soft rosy scarlet. *Sherlock Holmes*, rosy magenta. *Metallic*, rich crimson, tinted magenta. *Duke of Devonshire*,* rich crimson, large

circular flower. *Soldier's tunic*, intense scarlet. *Enid*, rosy red. *Olivia*, rosy red, tinted salmon. *J. Bidwell*, rich scarlet, white eye, dwarf. *M. Calvat*, crimson, white eye. *W. P. Wright*, bold scarlet. *Lord Salisbury*,* rich madder, a fine flower. *Miller's favourite*,* bright light scarlet, very fine, and very large flowers.

Orange and Yellow Shades.

J. H. Arderine,* largest and best orange yellow. *Geo. Reid*, bright orange. *Jealousy*, (improved) orange yellow. *Donald Beaton*,* clear orange, one of the best of this class.

Purple and Magenta Scarlet.

Sir Jas. Kitson,* purple magenta, the finest of this class (novelty, 1897). *Royal Purple*, very fine. *Britannia*, overlapping petals, circular flower, purple. *Majestic*,* purple crimson, circular flower, white eye. *Blue Beard*,* striking flower, dwarf, spreading habit. *Blue Peter*,* the nearest approach to blue, with white eye. *Marquis of Dufferin*, crimson magenta. *King of Purples*, very attractive, coloring purple, with shaded orange in centre.

Blush Self and Oculated.

Miss E. Wilson,* shaded, white ground, with reddish salmon (a novelty, 1897). *Duchess of Marlborough*,* soft salmon, mottled white and pink. *Duchess of Devonshire*,* very large, blush pink. *Delicata*, lavender. *Lady Brooke*,* clear white, with shade of pink in centre. *Duchess of Fife*,* very large, blush pink, fine flower. *Lady Reed*, purest white, with ring of pink in centre of petals.

Salmon.

Mrs. Pole Routh, one of the very finest Zonals, mottled salmon, deeper toward centre (novelty, 1897). *Mrs. Walters Partridge*, one of the largest and best flowers, intense soft salmon, sometimes mottled in cold weather, one of the best

novelties of 1897. *Cassiope*, salmon pink, very pretty. *Mrs. Dombrain, Magnificent*, deepest orange. *St. Cecilia, Wilhelmina*,* rich salmon scarlet, very fine. *Hilda, Mrs. Hall, Mrs. Rothera, A. F. Wootten*, very large flowers and trusses, salmon, with white eye. *Valkerie*,* mottled silvery salmon, darkest towards eye. *O. W. Holmes, Oenone, Florence Farmer, Mrs. Robt. Cannell*,* dwarf habit, large flowers, very lasting, immense truss, salmon. *Good Friday, New Star, Prosorpina, Midsummer, Countess of Derby.*

Deep Pink and Rose-colored.

Countess of Buckingham, Lady Carlile, Pink Domino, Gertrude Pearson, Mrs. French, Lucrece, Amphion, Mrs. Wildsmith, Ethel Lewis, Duchess of Portland, Lady Frances Russell.

White.

Niagara,* very fine. *Virgin, Duchess of York*,* very large, one of the best. *Snowdrop, Sea-gull*,* good, large. *Albion, White Lady, Eucharis, Agnes, Sir Percivale, Amy, Amphlet, Dr. Nansen, Ramsgate, White Bedder.*

Hybrid Nosegay Gigantea Section.

A great move in size of pips and trusses, flowers 2¾ inches in diameter, and are the beginning of again enlarging the size of Zonal Pelargoniums, and, though of the Nosegay section, their petals are much broader than they used to be in this class. *Vulcan*, scarlet. *General Dodds*, scarlet. *Mrs. Mayes*, flowers nearly 3 inches across, light salmon. *Mrs. E. G. Hill*, soft salmon. *Aurore Boreale*, light scarlet, tinged salmon. *Gloire Lyonnaise*, cherry rose.

The next step before Noseys—Semi or Hybrid Nosegays.

Suvarna, scarlet, *Dr. Macdonald*, crimson scarlet. *Flamingo*, rosy lake. *Octave Mirbeau*, light lilac magenta. *Livy*, orange red. *Candace*, reddish crimson.

Double flowered Ivy Leaf Pelargoniums.

These are very fine, with ivy leaf, and only of late years double flowers have been obtained. They are of creeping habit, unless pinched back and kept in bush form. They are very hardy, and more likely to succeed in the plains than Zonals.

Queen of Roses,* rosy magenta. *Beauty of Castle Hill*,* very fine and very large, soft rose. *Ryecroft surprise*, salmon pink. *Beauty of Jersey*, scarlet, shaded purple. *Corden's Glory*, scarlet. *Liberty*,* magenta. *Edith Owen*,* magenta. *Surcouf*, deep pink. *Giroflée*,* fine large flowers, magenta purple.

Pelargoniums—French Spotted and Early-flowering Varieties—are a completely different class from the Zonal Pelargoniums. Cuttings of these strike in the hills, just after the rains are over, with ease, but at other seasons are difficult; so it is best, just as the rains are going out, to put down tips from the plants. These make the best plants if struck in September and October. They flower from March to May, or June at the outside. These remarks apply to the Large-flowering Show Pelargoniums and Small Fancy Pelargoniums, all of which flower at the same time and make an exceedingly grand display during the time they last, hard to approach with any other flowers, and in the hills are truly superb.

French Spotted and Early-flowering Pelargoniums.

Mrs. Wright, delicate white crimson, maroon blotch. *Emma Hayes*, flesh color. *H. J. Jones* rosy red, maroon blotch. *Linda*, salmon, maroon blotch. *Queen Eleanor*, very large, white tinted blush, upper petals maroon. *Edith*, rosy crimson, edged lighter, blotch velvety maroon. *Prince George*,* crimped flowers, rosy tinted mauve, blotched and netted maroon. *Purple Emperor** purplish, maroon blotch. *Sultan*,* rich red and chestnut, feathered maroon, white centre. *Black Diamond*,* dark maroon, lilac round each petal. *Purity*,* larger

than Venus, both white and earlier. *Wilhelm Von Dracke*, crimson and purple blotch on upper petals. *Memorandum*, white, netted plum.

Mdme. C. Konig,* good pure white. *Mdme. Buck*, white, fringed, pink blotch. *Tommy Dodd*, lower petals blush, upper crimson and maroon. *Triumphans*, claret scarlet, shaded purple. *Evening Star*, deep crimson, small blotch, white throat. *Decorator*, crimson, maroon blotch.

LARGE-FLOWERED SHOW PELARGONIUMS.

Blush-rose,* rosy blush, crimson blotch, shading off to rosy red. *Duke of Portland*, rosy salmon, maroon and crimson blotch, slightly chocolate on lower petals.

J. W. Hayes,* lovely rich bright crimson, and brighter blotch on each petal.

Virgin Queen,* pure white, carmine spot. *Gratitude*,* blush purple, purple-lilac margin *Illuminator*,* crimson scarlet. *Blue Bell*, pale purple, black blotch. *Purple gem*, deep purple, top petals dark maroon, margin purple, like velvet. *Outlaw*, black top petals, crimson margin, white centre. *Malcolm*, deep orange scarlet, dark spot, pure white centre. *Cornet*, orange scarlet, small blotch. *Compactum*,* black top petals, cloudy maroon and crimson. *Mabel*,* dark maroon top, narrow edge heavily painted crimson, very rich in coloring. *Prince Leopold*,* scarlet, very bright.

SMALL-FLOWERED FANCY PELARGONIUMS. *(Profuse Bloomers.)*

Delicatum, light rose. *Sims Reeves*, purple, maroon spotted. *Penelope*, soft rose, white edge. *Mrs. Langtry*, white, rosy lilac spots. *Atlantic*, rich crimson, suffused purple. *Cherry Ripe*, bright rosy crimson, white centre. *Phyllis*, crimson, white centre. *Bridesmaid*, delicate pale lavender, edged white.

HYBRID DOUBLE SHOW PELARGONIUMS. *(Regal.)*

These are very lovely flowers, quite an acquisition, the King of Pelargoniums. *Lady Duff*, rich rosy red, 7 and

8 petals, much crimped. *Gen. Lassalle*, very large fine flowers, undulated petals, white, blotched rose. *Mrs. Innes Rogers*, large beautifully crimped flowers, rosy carmine, blotched maroon. *Duke of Fife*,* large clear lake, pure white margins and centre. *Cannells Double*,* pure white. *Volanté Nationale*,* large white, richly blotched rose carmine. *Triomphe de St. Mandé*,* rich magenta, suffused crimson, in immense trusses like a Hydrangea. *Princess of Wales*, rosy lake, marbled and netted white. *Bush hill beauty*,* very large, mottled rose. *Edward Perkins*, bright orange scarlet, maroon blotch, and beautifully fringed. *Queen Victoria*, crimped petals, rich vermilion, margined white. *Madame Thibaut*, white, blotched and marbled rose, crimson maroon blotch, large white centre. *Duke of Albany*,* very fine, crimson maroon, margined rosy lake, light centre, fringed, a lovely flower. *Madame Pape-Carpentier*, *President Harrison*, *Bouganville*, *Jean D'Arc*, *Carl Klein*, *Glorie de Tours*, *Duchess of Fife*, *Fimbriata alba*, *Denise* (white), *Princess of Teck*.

Before quitting Pelargoniums and Zonal Geraniums, I must mention the foliage section of Zonals, which requires the same treatment as the Zonals, flowered section.

GOLDEN TRICOLORS. *(Foliage.)*

Mrs. Henry Cox, *Masterpiece*, *Mrs. Walters*, *Mrs. Pollock*, *Sir R. Napier*, *William Sandy*, *Enchantress*, *Sophie Domaresque*, *Macbeth*, *Mrs. Turner*, *Princess of Wales*, *Peter Grieve*, *Adam Bass*.

TRICOLORS WITH VARIEGATED FOLIAGE AND DOUBLE FLOWERS.

Princess Henry of Battensburgh, *Lady Rosebery*, *Miss Ellen Terry*,* *Mrs. Parker*,* *Chelsea Gem*,* *Bronze Corinne*, *Mrs. Strang*, *Soleil Levant*, *Mary Anderson*.

All the above have lovely flowers and green foliage, variegated white.

SILVER TRICOLORS. *(Foliage.)*

*Mrs. Miller** (very fine), *Empress of India*, *Mrs. Laing*, *Dolly Varden*,* *Porteus*, *Lady Dorothy Neville*,* *Miss Farren*,

*Lass O'Gowrie, Eva Fish** (very fine), *Mrs. Clutton, Charming Bride, Prince Silverwings.*

ORNAMENTAL FOLIAGE VARIETIES.

Happy Thought, white centre, green round outside of leaf, dwarf habit. *Freak of Nature,* leaf crimped, white centre to leaf, and white foot stalks to leaf and stems. Branches sometimes quite white, with white leaves, very fine.

GOLDEN BRONZE.

Jubilee, Her Majesty, Zulu, Swanley Bronze, Bronze Queen, Marechal Macmahon, Golden Harry Hieover, Distinction, White distinction (white flowered), *Black Vesuvius.*

YELLOW-LEAVED SECTION. *(Foliage.)*

*Verona, Chrystal Palace Gem,** *Creed's Seedling, Robert Fish** (very dwarf).

WHITE-EDGED VARIETIES. *(Foliage.)*

*Boule de Neige,** variegated. *Prince of Orange,** dwarf habit, small foliage, orange scented. *Little Trot,** 6 inches high, leaves bordered white. *Vicountess Crainbrook, Miss Kingsbury, Flowers of Spring,** dwarf. *Brilliantissimum, Dandy,** very small leaves. *Mangles,* variegated. *Lady Plymouth* scented leaves and variegated. *Mme. Salleroi, Mrs. Mappin.*

VARIEGATED IVY LEAF SECTION.

Duke of Edinburgh, L'Elegante, Aureum marginatum.

Then there are the scented leaved varieties, which are not so much in fashion now as they used to be many years ago. Their leaves are much divided. Flowers insignificant. All these require the same treatment as Zonals.

PARTICULAR DIRECTIONS FOR THE HILLS.

As before remarked, Zonals require little care: up in the hills they thrive wonderfully. They must, however, be well-

cultivated to keep up the health of the plants and size of the flowers ; that is, during the whole of spring, summer and autumn, the soil should be well stirred up round the pots once a week, and have weak liquid manure once or twice a week when in flower. It is liable to produce leaf at the expense of lessened flower if too much liquid manure is used, or if it is used too often, or too long. During winter, they should be watered once a week, or every five days, and kept in a conservatory or room to protect them from frost. On fine days the pots should be placed in the sun to harden the plants. The stems at the close of winter should be firm, and not flabby. Then, on the approach of spring, water by degrees more copiously, and, when in bud, with liquid manure once or twice a week, and the display of flowers will be in gorgeous profusion. Before they come into flower, syringe the leaves three or four times a week, and it will repay you handsomely.

They do not flower so well if grown in beds in spring, but do better if the pots are sunk in the beds, in a sheltered spot. When the rains set in the plants can be taken in.

In the rains, the plants in the hills grow very vigorously and require shelter from rain and little watering. Geraniums are in constant flower, but at this time they flower less freely.

Particular Directions for the Plains.

Zonal Geraniums require much attention in the plains during the hot season and rains, to keep them as cool and dry as one can consistently with just keeping them alive. Before the rains set in, the plants must be well hardened off, and kept out of the rain and exposed to sun for a portion of the day, so that their stems are not flabby, thick and green. They will then outlive the rains if grown in ring pots, the space between the inner and outer pots being filled with sand. This should be done before the hot season comes in in February, at the close of which they must be freely

watered and pushed on, kept in full bright light, but not in sun. Syringe the leaves well, and water occasionally with liquid manure, and by March begin to harden the plants off.

Some people would not care to take all this pains; to them I would advise getting down rooted plants at the close of the rains from the hills from Mr. C. G. Ollenback, who has one of the finest collections in India. He brings them up with him from his Dehra Dun garden to Mussoorie in April, and takes them down again in November.

I have a very fine collection from him, which are a source of great pleasure to me, as they are in constant flower all the year round in Mussoorie, and especially so in spring, when their wealth of flower is astonishing: as also the great size of pips and trusses is so remarkable as to at once show the great improvement made in this plant in modern times.

They never do well out of doors in beds in the sun in the plains: the sun is too powerful for them.

GESNERA.—*(Tuberous or bulbous-rooted pot-plant, for the plains and hill-stations.)*

Nat. ord., Gesneraceæ.

Very few of these do in the plains, generally speaking, yet some of them seem to thrive in the Calcutta gardens. Most of them are tuberous rooted, and require a well drained light soil. Some of the succulent leaved varieties are multiplied by leaf propagation in the rains. Other varieties are propagated by the increase of tubers, and cutting of the shoots, after the plants have just started. They are lovely flowering and foliage plants. In the hills, in a moist atmosphere, they thrive and give little trouble, but they require some bottom heat.

Gesneria refulgens has lovely velvety leaves of a purple tint. Flowers rich red.

Gesneria Douglasii bears vivid orange red flowers in spring.

Gesneria tubiflora, white or primrose colored flowers. Roots much like a potato.

Gesneria leichtlina, leaves crimson flushed, velvety. Very pretty, pale vermilion flowers.

Gesneria tuberosa, scarlet flowers.

Gesneria purpurea, purple flowers.

G. Naegeloides, rosy pink flowers, marbled red, throat yellow. There are many varieties of this. They all bear tubular flowers, some of them most sweetly scented.

GILIA.—*(Annual.)*

Nat. ord., Polemoniaceæ.

Not a very attractive annual. The best, perhaps, *G. Tricolor*, bears trusses of flowers much like a phlox. Sow at the same time as other annuals, in pots, and transplant to the open border in beds or ribbons. *G. Capitata*, *G. Achillifolia*, *G. Androsaceæ.*

GINORIA.

Nat. ord., Lythraceæ.

G. Ameriana, a shrub with myrtle-like foliage and purple flowers, which are borne in the hot weather and rains, succeeded by purple berries in the cold season. It is propagated by seed and cuttings put down during the rains.

GLADIOLUS.—*(Bulbous plant, for hill-stations and the plains: for pots or beds.)*

Nat. ord., Iridaceæ.

These are grown to perfection in this country, either in pots or beds, both in hill-stations and in the plains of India. They should have a background of shrubs, and are thus seen to the greatest advantage, and are truly splendid, both in color and form. They are divided into two sections—the summer flowering varieties in England are called the *Ramosus*, as also are its seedlings; and the autumn

flowering varieties are called the *Gandavensis*, as also are its seedlings. The flowers of both sections are as beautiful and brilliant as they are various. Grown in masses they make a splendid show. A new class, called *Nanceianus*, has been brought out with very large flowers. *Lemoinei* is another new class of hardy Gladioli, but I should say *Gladiolus Childsi* are the finest of all the race, with much stronger growth and very large flowers. Unfortunately these are rather expensive yet.

Cut flowers of Gladioli last for a long time, and the French decorate their gardens with them placed in bottles of water, which are sunk in beds, where there is a deficiency of color. Roots or corms of the *Ramosus* species should be imported as soon as they arrive from Holland, in England, that is, in November, which is late for the plains, or such as are to be got before that may be procured from seedsmen and planted in October, November, and December, in the plains, for succession: and in hill-stations they should be planted in February, March, April, May and June for the purpose of succession. Not less than six corms or more than twelve should be planted in one spot to form a group. The soil in which they are planted should be light, open, and rich, having a quantity of sand in it.

When they are in flower they may be taken up with some earth round them, and placed in pots to decorate the plant-house, orchid-house, conservatory, verandah or hall. They flower mostly in the rains, and if left in the open their flowers get much battered and spoilt. They require full sun while growing till they are in flower. Seeds of Gladiolus should be sown in September and October, both in the plains and hill-stations, under glass, and when they have grown strong enough may be transplanted in pots by threes or fours according to the size of the pot. Seeds may be sown in hill-stations in February and March, also in pots in a hot-bed under glass, but raised from seed they will not flower before they are two years old or longer.

In planting, the soil should be well and deeply dug, and mixed with sand and leaf-mould. The bulbs should be planted 6 inches deep. If the weather is cold in the hills, cover the spots the bulbs are planted in with cocoanut fibre or newly dropped leaves. The best method is to start the bulbs in pots and transplant them, taking care the rootlets are not injured. There are many varieties of all the species, which any seedsman can supply.

The corms of these Gladioli will be planted in the plains at the same time as directed in the foregoing remarks: but in hill localities the bulbs of the autumn flowering *Gladiolus*, or *Gandavensis*, will require to be planted in February, March, April, and May. The bulbs arrive from France in England about the beginning of December. After flowering the bulbs must be taken up and kept dry in pots or boxes. The new bulbs form on top of the old ones, and may be divided; there are also very small bulbs, called spawn, that form round the old corms at the ends of the roots in autumn. Sometimes, but not always, in this country, unnamed seedlings may be procured, and they are cheap and very often good. Named varieties are dearer.

GLORIOSA SUPERBA.—*(Tuberous-rooted plant, for beds or pots.)*

Nat. ord., Tulipaceæ.

This slender creeping plant is really beautiful, and in many parts of India may be found growing plentifully in a wild state in the low scrub jungles. It bears curious flowers. The petals are wavy,—one-half light-yellow and the other half crimson. They change in color to a deeper shade of crimson, as the flowers grow older. In the cold season it dies down, and comes up again the next year in the rains. It flowers in great profusion all through the rains and after them. The best plan is to leave the tubers undisturbed and re-pot them just before the rains set in, when they will require to be well watered. The soil they

thrive in best is of a light open nature; and if they are grown in pots, secure good drainage. They grow without any trouble in the open border, where they will come up, year after year, of their own accord, and without any particular care bestowed on them further than looking after small caterpillars, which often do much harm to them, destroying both foliage and flowers. The caterpillars should be destroyed as soon as found. Propagated by division. These plants are not suited to the hills at high elevations, except when grown with bottom heat in conservatories.

GLOXINIA.—*(Tuberous-rooted pot-plant: some sweet-scented.)*

Nat. ord., Gesneraceæ.

This is a numerous genus of tuberous-rooted pot-plants with exquisitely pretty flowers. These plants will require a certain degree of heat, and propagation under glass in hill localities. They grow very well in any glazed verandah, placed in a pot on a shelf. Entire shelter from the sun is best for them. Their seeds should be sown in February, March or April in the hills, under glass in a moist atmosphere. These flower during the autumn, and are of various very rich colours. They must be sheltered from rain. In the plains they may be started under glass, but they do very well without it. Unless the weather is very dry and they start into growth, through mismanagement, before the west winds have stopped blowing, these being too dry for them, they often germinate, and then die off, sometimes not to come up again. Their tubers may be divided, or they may be propagated from a single leaf, which is far the most rapid way of propagating good varieties. When seed is sown there is always some danger of the young plants damping off. To prevent this, as soon as they can be handled, they should be pricked out and re-potted, when great care should be taken, in watering, not to supply them with too much water at a time till they are strong.

After they have done flowering, withhold water gradually, and, when dry, store in a paper bag or box containing sawdust

or sand. In the plains there is some difficulty in flowering these lovely plants, especially if they are started when the weather is dry. They should be started in the plains in October or November, and again in July or August, so that two crops of flowers may be got from them, which, I think, is far the best method to adopt with them. In the hills I start the tubers in February or March. The florist garden varieties now to be obtained are very superior to the old descriptions that used to be cultivated, and can be got from florists and seedsmen in this country.

I would advise any one who wishes to grow them in the plains to obtain the bulbs from the hills or from home, and they will be much more likely to succeed with them than with seeds. Plant the tubers on a mixture of cocoanut fibre, peat and charcoal, and then some of it should be heaped up over them, leaving space to water round it in the pot. The drainage must be perfect. You may not have peat, and in that case use charcoal, leaf-mould (not too old), and a little turfy loam, and chopped cocoanut fibre. Turfy loam is not necessary at all if you have peat, but that is not always procurable in this country, and you will have to make the best substitute for it you can. Water round the rim of the pot sparingly till the tubers shoot up, and then more copiously. The erect flowering varieties are the best, because their colors are best seen. The spotted varieties are very handsome, as also the self-colored sorts. Of either, the erect growing varieties are the best, as more of the beautiful colors are seen.

Named varieties may be chosen, but they are more expensive. Water with liquid manure, or liquid manure made from any of the artificial manures, when the plants are in flower, and it will be found beneficial to them. When they have done flowering, withhold water and dry off, and store the tubers as recommended above. Seed of the Heatherset Hybrid, which is a very superior strain, can be got from seedsmen. The Himalayan Seed Stores have it.

GMELINA.—*(Small trees.)*

Nat. ord., Verbenaceæ.

The only two species of Gmelina worth growing in this country, or perhaps elsewhere, are *G. Hystrix*, bearing yellow flowers, and *G. Paniflora*, also yellow. Propagated from cuttings of firm wood.

GNIDIA.—*(Small shrubs.)*

Nat. ord., Thymelaceæ.

Mostly downy-leaved plants with funnel-shaped flowers, pale yellow or white, rather insignificant. *G. Eriocephala* bears dense heads of flowers of a pale yellow color, which are pretty. *G. Tomentosa*, pale yellow. *G. Pinifolia*, white.

They bear their flowers in February and require a moist atmosphere.

GODETIA.—*(Evening primrose; annuals for pots or borders.)*

Nat. ord., Onograceæ.

There are some exquisite varieties of the evening primrose, which have during late years been called *Godetia*. They are all very handsome and most attractive annuals, which, in the plains, should be sown in October, and in hill-stations at the same time as other annuals. Sow the seeds in pots and transplant to other pots, or in the border in rich soil.

G. Duchess of Albany: glassy white.

G. Gloriosa: white, with blood-red spot.

G. Lady Albermarle: brilliant crimson.

G. Princess of Wales: ruby crimson, pencilled rose and grey.

G. Whitneyi: pure white; flowers varying from flesh to crimson.

G. Rosea Alba, crimson blotch on white or rose color.

GOLDFUSSIA.—*(Shrub.)*

Nat. ord., Acanthaceæ.

Small shrubs from two to three and a half feet in height. *G. Anisophylla* bears pale blue flowers of a bell-shape. *G. Glomerata* bears deeper blue flowers than the last, with white tubes; its leaves are of a whitish green. *G. Lamiifolia* bears lilac thimble-formed flowers. *G. Colorata* bears crimson bell-formed flowers on sprays, and is a handsome shrub. *Goldfussia* grows well in any ordinary garden soil. They are easily propagated by seed or by cuttings put down in the cold season in October or November.

GOMPHOCARPUS.—*(Shrub.)*

Nat. ord., Asclapiadeæ.

This is a pretty shrub, with opposite leaves, which bears umbels of flowers succeeded by fruit, which is bladder-like, about the size of a hen's egg, on the surface of which there are blunt thorns. The shrub is altogether most graceful and desirable. Propagated by seed, also by cuttings put down during the rains.

G. Fruticosus bears white flowers on downy peduncles. Its leaves are linear-lanceolate.

G. Padifolius, purplish green corolla, lobes and crown purplish yellow. Leaves broadly ovate.

GOMPHRENA.—*(Bachelor's Button. Everlasting annual flowers.)*

Nat. ord., Amaranthaceæ.

This is known to all of us as the Bachelor's Button; an annual, though it not unfrequently lives from year to year without being renewed by seed: yet I would recommend its being re-sown yearly, as old plants are apt to grow very untidily and make the beds look unsightly. In cold climates it is invaluable as a winter decoration, and nothing is more easily grown. Sow the seed in June or July, in the open border

or in pots, and transplant when strong enough to prick out. They may be sown in cool climates at any time of the year when the cold is not too great for the germination of the seed. The flowers are small, globose, and borne in great profusion. If the flowers are cut to keep in a dry state, they should be thoroughly matured, or they will lose their brilliancy.

GOSSYPIUM.—*(Cotton shrub.)*

Nat. ord., Malvaceæ.

There are probably only three species of this genus of plants, which have large showy yellow or purple flowers. Their leaves are three to nine lobed. After the flowers they bear a five-celled capsule, which burst when ripe and exposes its seeds covered with down. They thrive in a rich soil of leaf-mould and ordinary soil with a little manure and sand. Propagated by seed sown in the plains in October.

G. Baham, an erect growing shrub.

G. Nagaense, more branching than the above.

They are not of much merit as garden plants, but do to hide unsightly walls, or as a background.

GOUANIA.

Nat. ord., Rhamneæ.

Shrubs of botanical interest only. *G. Domingensis*, the chaw stick of Jamaica.

GRAPTOPHYLLUM.—*(Shrub. Caracature plant, ornamental foliage.)*

Nat. ord., Acanthaceæ.

G. Hortense is not a very interesting shrub, but *G. Luridus pictum* has pretty foliage, its leaves being heart-shaped, mottled with white. It bears pretty pink flowers. There is a variety with purplish leaves and blood-colored flowers—*G. Rubro.*

GREIGIA.

Nat. ord., Bromeliaceæ.

Plants with leaves like pineapples, spiny along the edge. They require the same treatment as *Billbergia*, which see. They are best grown in a plant house or grass house. *G. Sphacelata* bears rose-colored flowers in dense heads. Bracts large, tinged green.

GREVILLEA.

Nat. ord., Proteaceæ.

This is a very large genus, consisting of trees and shrubs, of which the following species grow readily in this country, both in the plains and hills, and are very ornamental in foliage, as well as bear flowers of more or less interest.

G. Banksi bears red flowers in dense terminal racemes, leaves deeply pinnatifid, height about 15 feet. *G. Robusta*, a handsome tree, bearing orange-colored flowers in racemes, panicled. Leaves pinnate and silvery white beneath. *G. Hilii*. *G. Thelemanniana*, a lovely species of shrub, 3 to 5 feet only. Flowers deep red and yellowish at the tip, in dense pendulous racemes. The most elegant of the genus. They are all propagated from seed or by layers.

There are many varieties well worthy of introduction. *G. Alpina*, flowers red yellow, height 4 feet. *G. Fasciculata*, bright red with yellow tips, height 3 to 4 feet. *G. Lavandulacea*, rose. *G. Macroslylis*, crimson and yellow, height 4 to 6 feet. *G. Punicea*, bright deep red.

GRIFFINIA.

Nat. ord., Amaryllideæ.

These comprise about eight species of highly ornamental plants. Their leaves are broad and peculiarly netted. They require a light porous soil, well drained, and are propagated by division. *G. Dryades*, flowers purplish lilac, in large umbels, 10 to 15 flowers on each. Individual flowers are about 4 inches in diameter. The leaves are one foot long, oblong

lanceolate. *G. Hyacinthina* has 10 to 12 flowers in an umbel, blue at the top and white at base. Leaves with lattice-formed venations. *G. Ornata*, flowers lilac or blue, 20 to 25 in umbels. The leaves are elliptic oblong.

I have no practical knowledge of these, but I think they would do best at low elevations in the hills, and in plant houses in the plains.

GRISELA TOMENTOSA.—*(Small tree.)*

Nat. ord., Lythrarieæ.

This large shrub, or small tree, of about 8 feet in height, is an object of great beauty when in full flower at the end of the cold season, being one blaze of brilliant scarlet color. The foliage of this plant is coarse, but its flowers amply make up for this shortcoming. *G. Secunda*, flowers pale pink. Propagated by cuttings.

GUSTAVIA.

Nat. ord., Myrtaceæ.

Gustavia are a genus of handsome trees, with showy flowers on one-flowered peduncles, sub-umbellate. Their leaves are large, alternate and ovate, or spatulate glossy. They require a rich loamy rather moist soil, much the same as *Barringtonia*. Cuttings may be struck during the rains. *G. Gracillima*, rose red flowers, produced from the axils of the leaves in young plant, and from the wood in old ones. Leaves recurved and spreading, acuminate and serrate, somewhat waved. *G. Insignis*, creamy white, externally rose colored, 5 to 6 inches, spreading, anthers orange. *G. Pterocarpa*, much like *Insignis*, but flowers smaller and white. These would do best in the grass conservatory.

GYNERIUM.—*(Pampas grass.)*

Nat. ord., Gramineæ.

These are handsome and noble-looking grasses, of which *G. Argenteum* is chiefly grown. It bears a huge dense silky

panicle of flower, attaining a height of from 6 to 10 feet. Leaves linear, 4 to 6 feet. Other varieties have been raised from this with purplish and yellowish tinted panicles. Propagated by seed or division during the rains.

HABRANTHUS.

Nat. ord., Amaryllideæ.

These plants are now referred to HIPPEASTRUM and ZEPHYRANTHES.

H. Andersonii.

H. Bifidus.

H. Gracilifolius.

H. Miniatus.

H. Versicolor.

See HIPPEASTRUM.

HABROTHAMNUS.—*(Shrubs.)*

Nat. ord., Cestraceæ.

These are rather an extensive genus of most handsome shrubs, which are very choice and attractive. They have mostly rough lanceolate leaves, and bunches of pretty heath-like flowers, borne in great profusion, of brilliant colors and of a waxy appearance. They will require some protection in very cold weather, in the hill-stations, during the winter months; but in the cold season of the plains they grow vigorously, though in the latter localities old plants often die off during the rains; and for this reason a stock of young plants, made from cuttings taken during the previous cold season, should be kept to replace them. In England they are grown in peat and loam. In this country they grow well in turfy loam, leaf-mould, and a little sand with good drainage, especially if they are intended to withstand the rains. Propagated by cuttings in October.

H. Elegans: carmine, 6 feet.

H. Hugeli: bright claret, very handsome, 5 feet.

H. Fascicularis: bright crimson, 5 feet.

H. Aurantiacus: orange yellow, 8 feet: from Mexico.

H. Zephyrinus: shaded red; 5 feet: from Mexico.

H. Lutto de Comte de Rossi: red, shaded violet, and tipped with white, 5 feet.

H. Bondouxii: red, 5 feet.

HÆMANTHUS.—*(Blood flower.)*

Nat. ord., Amryllideæ.

There are about thirty species of this lovely plant. They succeed best in a hill climate of about 50 to 60 degrees, though they have been flowered successfully in the plains.

They should be rather under-potted and planted in a good rich light soil. As they grow they should be supplied with weak liquid manure and have good ventilation. In the plains they do best in a plant house.

H. Abyssinicus, flowers appear in a head before the leaves. *H. Albo Maculatus*, whitish. *H. Cinabarensis*, vermilion. *H. Natelensis*, orange scarlet, bracts purple. *H. Tigrinus*, deep crimson; and many others, including *H. Kalbreyeri*, bright crimson, which is a fine species. I have seen them flowering well in Mussoorie.

HÆMATOXYLON.—*(Logwood tree.)*

Nat. ord., Leguminosæ.

H. Compechianum.—A small tree growing to about twelve feet in height; of slender form, leaves glossy, the whole tree is elegant, more so when covered with its small yellow flowers, which are fragrant.

HAKEA.

Nat. ord., Proteaceæ.

Their leaves are very diverse in shape, and alternate. They are propagated by cuttings in a cool sheltered position,

and then allowed some bottom heat. They are suitable to the hills.

H. Cucullata, flowers red, small, and in dense clusters. The leaves are leathery and cordate, milky green. *H. Dactyloides*, flowers white, small, in clusters. Leaves linear oblong, lanceolate. *H. Nitida*, white, in racemes: leaves obvate oblong. *H. Suaveolens*, flowers white, sweet-scented, in racemes. Leaves furrowed above and pinnatafid.

HAMELIA.—*(Small tree.)*

Nat. ord., Rubiaceæ.

Hamelia Patens.—A shrubby tree, which bears orange pipe-like flowers in sprays, succeeded by red berries. Propagated by cuttings or seed.

H. Sphærocarpa is even prettier than *H. Patens*, and bears larger flowers. In the cold season it loses its leaves and should be pruned.

HAMILTONIA.—*(Shrub.)*

Nat. ord., Rubiaceæ.

Large shrubs, bearing sweet-scented flowers in panicles. *H. Azurea* flowers in the cold season with lavender-colored flowers, and *H. Suaveolens* with white flowers at the close of it. *H. Scabra* bears azure-blue flowers, and *H. Spectabilis* lilac-blue flowers. The leaves of these shrubs are opposite and ovate-lanceolate, shortly petioled. They soon grow unsightly if not pruned yearly to keep them in good form. They are propagated readily by cuttings of half-ripe wood put down in October. These shrubs grow to about four to five feet in height.

HAWORTHIA.

Nat. ord., Liliaceæ.

These are small aloe-like plants, with rosette leaves, short, broad, thick and fleshy. They are propagated by

division of offsets. They require the same treatment as aloes, which see. *H. Albicans*, *H. Atrovirens*, *H. Arachnoides*, *H. Attenuata*, *H. Cymbifermis*, and many others.

HEDERA HELIX.—*(Creeper. Ivy.)*

Nat. ord., Araliaceæ.

The common Ivy does not generally thrive in the plains of India, but grows without any care in the cooler climates of hill-stations. They do best when placed in a northerly aspect in the plains, but do not make much growth. We have not many varieties of Ivy in the hills.

H. Arborescens is common enough, as well as *H. Helex*. *H. Digitata* is not so common, but there are not many of the variegated kinds to be found, such as *H. Helix Algeriensis variegata*. *H. Helix Conglomerata* is a pretty variety, as also *H. Helix Donerailensis*.

HEDYCHIUM.

Nat. ord., Scitamineæ.

Hedychiums are cultivated most easily in the plains, in tubs, in plant houses, and for sub-tropical gardening are valuable in the same way as Cannas, but they require more shade and moisture, and grow well near the bank of a tank in the partial shade of trees or such like situations.

H. Acuminata: flowers handsome, fragrant, pale yellow and white.

H. Augustifolium: dull red.

H. Chrysoleucum: white, yellow centre.

H. Cœcincum: bright scarlet, a Himalayan variety, found in Mussoorie plentifully.

H. Coronarium: very fragrant, white: the garland flower, known as Dula Chumpa by natives. It has a greenish eye.

H. Gardnerianum : very fragrant, buff or lemon color.

H. Flavum : bright orange, fragrant.

H. Spicatum : yellowish.

HEDYSARUM.—*(French Honeysuckle. Annual.)*

Nat. ord., Leguminosæ.

An annual with dark foliage, bearing dull red flowers. Sow at the same time with other annuals and transplant to the border.

HEDYSCAPE.

Nat. ord., Palmæ.

A tall slow-growing palm.

H. Canterburyana.

HELIANTHUS.—*(Sunflower. Annual.)*

Nat. ord., Compositæ.

Sunflower seeds should be sown at the same time as other annuals. They are generally large coarse plants. Sow the seeds in the border, where they are to remain. In the hills sow in spring, in the open, in April, May or June.

H. Annus plenus : yellow, 6 feet.

H. Californicus striatiflorus : orange, 6 feet.

H. Argyrophyllus : silver-leaved and golden flowered, 4 feet.

H. Autumnale superbum is a hardy perennial; flowers in abundance, small, 2 to 2½ inches, golden yellow. Plant 4 to 10 feet, in accordance to soil.

H. Pumilum : yellow, 1½ feet.

H. Cucamerifolius : yellow, with black centre, 3½ feet.

H. Uniflorus : huge flowers, 15 inches across, yellow, dark centre, 6 to 8 feet, and many others.

HELICHRYSUM.—*(Everlasting flowers. Annual.)*

Nat. ord., Compositæ.

Very pretty, dry, husky flowers, which look pretty in mixed borders, and when cut remain unchanged for many months.

They should be sown in pots in October in the plains, and at the same time as other annuals in hill-stations in spring, and transplanted to other pots or to the border.

H. Compositum maximum fl. pl., 2½ feet, colors various.

H. Nanum: ½ foot, colors various.

H. Monstrosum: 2 feet, colors various.

HELICONIA.

Nat. ord., Scitaminea.

Plants with plaintain-like growth and habit. Propagated by division. They are best grown in grass houses in a rich soil.

H. Aureo-striata: foliage green with golden stripes.

H. Metalica: green and bronzy veins.

H. Roseo-striata: green, rosy veins.

These are of easy culture and splendid foliage plants. *H. Triumphans* is of later introduction. Leaves green with dark greenish black stripes. *H. Bucciana* is an older species, well known in Calcutta, rather erect growing, with prominent ribs to the leaves. They are benefitted by a moist atmosphere, and syringing frequently improves the leaves.

HELICTERES.

Nat. ord., Sterculiaceæ.

Helicteres Isora or screw tree is not interesting. It bears small pale red flowers, succeeded by peculiar twisted pods. The juice makes India-rubber. Propagated by seed.

HELIOPHILA.

Nat. ord., Brassicaceæ.

H. Arabioides.—This is a rather pretty little plant, which bears bright blue flowers. Sown at the same time as annuals in the hills and plains.

HELIOTROPIUM.—*(Heliotrope Shrub. Sweet-scented flowers.)*

Nat. ord., Boraginaceæ.

This is a most delightful flowering shrub, well known to all of us, but rarely seen properly cultivated in the plains, where it will attain to large size if carefully treated. I have had it growing on trellis-work to the height of 4 or 5 feet in Behar, and covered with a profusion of bloom. I treated the plants as below described, rearing them from cuttings put in sand under glass. When the cuttings have rooted themselves, pinch off all side shoots that appear, or disbud the plants of all side shoots till about a foot and a half high, then train them on a trellis-work of bamboo, examining them every week to pinch off the shoots that may have grown, and to hang those blown out by the wind. The plants, after they are disbudded, should be planted in the open. To enable them to flower well, it is necessary to let them remain in the full rays of the sun, for if they are at all shaded while flowering, or just before flowering, they never make a good show. The soil they are grown in should be of a light description. What I used was alluvial Ganges deposit, of a light sort, manured largely with leaf-mould; and cow-dung made into liquid manure was used twice or three times a week just before the plants flowered and while they were flowering. They may also be grown from seed and trained in the same way, or as a bush, which is also very pretty, and by heaping up a lot of brick rubbish, and on this placing the soil in the shape of a mound, on which the plant is to be grown and allowed to hang over on all sides. *H. Voltaireanum*, flowers purple. There are other varieties with white and blue flowers. The seeds should be sown at the same time as annual seeds are sown. There are many much improved varieties of the Heliotrope which yield immense heads of flower. *Queen Marguerite*, deep blue, is a fine variety. *H. Delaux* is a variety with marbled yellow foliage. *Jean d'Amour*, light-

colored flowers, an improved *Miss Nightingale*. *Madame de Bussy*, blue, with white centre, in huge panicles, very sweet-scented. *The Queen*, nearly white, very fragrant. *Swanley Giant*, bright blue, immense truss. A packet of the Giant mixed Heliotrope seed should with care yield many plants if sown in October in the plains and April or May in the hills.

HEMEROCALLIS.—*(Day Lily. Bulbous plant.)*

Nat. ord., Liliaceæ.

H. Fulva, a rather common plant in most gardens in the plains of India, bears reddish yellow flowers, which are sometimes double. Propagated by division. In Mussoorie it is a weed, not easy to exterminate, and I think impoverishes the soil. *H. Flava*, sometimes called the "Lemon Lily," is a choice fine sweet-scented flower, is well worthy of a place in the garden, is pretty, and a useful variety. *H. Fulva fol. var.* has variegated leaves. *H. Kwanso* has double flowers, orange red with crimson netting. *H. Aurantica major*, a new introduction: spikes bearing many flowers, rich orange yellow.

HENFREYA.

Nat. ord., Acanthaceæ.

(Syn. Asystasia.)

Rather pretty flowers, produced in terminal clusters, thimble-shaped, in March. The leaves of this plant are ovate acute and glabrous. *H. Scandens*, white. Propagated by cuttings in the rains.

HEXACENTRIS.

Nat. ord., Acanthaceæ.

A large climber, with oblong obtuse leaves, narrow, with parallel nerves or cordate. The flowers are borne during the cold season, are orange red, and rather pretty. This plant must be kept well pruned in, as it takes up much space if allowed to grow on.

HIBISCUS.—*(Annual – others perennial—shrubs.)*

Nat. ord., Malvaceæ.

This is a large genus of perennial and annual plants, very common in our gardens, and is easily propagated from seeds, cuttings or layerings. Firminger in his valuable Manual on Gardening mentions no less than nine distinct species, with other varieties more or less allied to them. Many of them seem so much alike as hardly to be distinguished from one another. A few choice sorts will be quite sufficient to place in any garden.

The following are perennials and grow to about 7 feet high, and are better of being cut in after flowering :—

H. Mutabilis : double white flowers, shading to pink.

H. Tortuosus : primrose-colored with puce centre: when older, turns crimson.

H. Tortuosus : (another variety) of purple, changing to red when fading.

H. Heterophyllus : white, shaded pink.

H. Rosa Sinensis : brilliant scarlet.

H. Tricolor Japan : rose colored with crimson blotches.

H Sunset : new.

H. Rosa Sinensis brilliantissimum and *H. R. S. Chrysanthus* are new varieties.

H. Liliflorus : white, with puce centre.

H. Pedunculatus : rosy pink, 3 feet.

H. Puniceus : scarlet, very bright, and large flowers, 4 feet; and many others.

H. Africanus : hardy annual, cream color, puce centre, 1½ feet, sown in October.

H. Lindleyi : crimson, annual; sow seeds in October.

H. Giganteus : primrose color, annual; sow seeds in October.

HIGGINSIA, HOFFMANIA, OR OHIGGINSIA.

Nat. Ord., Rubiaceæ.

These are very handsome-leaved plants, the genus comprising about 20 species. In the plains they do best in a grass conservatory, and in the hills under glass in winter, though they may be kept out of doors in warm weather, planted in light soil with mortar in it. The leaves are truly beautiful.

H. Gheisbreghtii.—The leaves are large, ½ foot long, or more, and broad, oblong lanceolate, upper surface dark velvety green, underneath purple red; veins very prominent. *H. Gheisbechtii* is a form of the above, with creamy white, yellow and red blotches: known in Calcutta as *H. Gheisbreghtii variegata. H. Refulgens*, leaves 3 to 5 inches long, narrow, obvate sub-acute and contracted at the base, upper surface dull green, flushed red, more so towards the margins, under surface pale red.

H. Ortgiesii, H. Refulgens argeroneura, H. Robusta, H. Discolor, H. Pedunculata.

HIPPEASTRUM.—*(Knight's star lily. Bulbous plant.)*

Nat. ord., Amaryllidaceæ.

These are all large bulbous plants with strap-formed leaves, much like Amaryllis, and often put down in catalogues as such, and it is to avoid this error that I mention this here.

Hippeastrums are more or less evergreen. Though they require a season of rest, they should never be entirely deprived of water. A rather heavy soil suits them best, though in this country they are quite hardy, in the sense that they grow almost in any soil and with little care. They do very well in pots, but also thrive in the open beds. In the hills they will not stand the winter in the open ground, so have to be potted and brought under shelter from frost. They are easily propagated by division, as the bulbs increase rapidly; also by seed sown as soon as ripe.

H. Ackermanni : crimson, large.

H. Alberti : orange red.

H. Aulicum : striated, very handsome, crimson purple, green at base.

H. Equestre : orange green. There is a double variety of this flower.

H. Pardium : cream, dotted crimson.

H. Reticutalum : pink and white, leaves with a rib of white.

H. Vittata : clear white, with two stripes of red on each perianth segment.

And many others, besides hybrids which have been raised.

HIPTAGE.

Nat. ord., Malpighiaceæ.

H. Madablota.—This is a large climber, with lanceolate-pointed leaves, very pretty when in flower, which it produces in great profusion, and which are much like that of the horse chestnut. Propagated by seed and layering.

HOLMSKIOLDIA COCCINEA.—*(Shrub.)*

Nat. ord., Verbenaceæ.

A rather pretty spreading pubescent shrub, with opposite leaves, which bears red tubular flowers in great profusion just before the cold weather sets in. The plant should be well cut in after flowering. Propagated by seed or cuttings.

HOMALOMENA.

Nat. ord., Aroideæ.

These are rather handsome aroid, much like Alocasia, of which there are 20 species. For cultivation, see Caladiums. They should be grown in a grass conservatory. *H. Aromatica*, native of Chittagong. *H. Picturata*, leaves cordate, basal lobes rounded, mid-rib with a white stripe. *H. Rubra*, yn. *Rubescens*, leaves sagittate, cordate and dark green; the

lower surface reddish. *H. Wallisii*, leaves with a white edge, and sprinkled with bright gold blotches. This species has not been introduced yet.

HOYA.—*(Wax plant. Creepers.)*

Nat. ord., Asclepiadaceæ.

A most beautiful and interesting genus of plants, having thick waxy-looking leaves and flowers. Most of them are natives of Java. They all require a soil made very porous, with drainage of potcherd, leaf-mould, cocoanut fibre, or moss, all mixed together. All Hoyas grow easily from a single leaf, with its leaf stalk half buried in sand, also from cuttings in sand. They love to grow in shade, and require a bamboo trellis or log of wood to grow upon.

H. Carnosa: flesh-colored flowers.

H. Potsii: buff-colored flowers.

H. Mollis: white with purple eye.

H. Bella: leaves very small; flesh-colored flower, purple centre.

H. Paxtoni.

H. Simmondsii.

H. Macrophylla.

H. Imperialis, and many others.

HUMEA.—*(Shrub : half-hardy biennial, sweet-scented. The humble plant,)*

Nat. ord., Compositæ.

Humea Elegans.—This is a very handsome plant. Planted in the border, it grows to the height of 7 feet, and is very ornamental. The leaves, when slightly rubbed, yield a powerful odour. Its name is very appropriate to it, owing to its drooping habit. Its flowers are red, borne on spikes, and emit a most delicious and strong scent. It is easily renewed from seed, and is better renewed early.

HUNNEMANNIA FUMARIÆFOLIA.—*(Annual.)*

Nat. ord., Papaveraceæ.

This plant much resembles the Californian Poppy, or *Eschscholtzia*, and bears flowers similar to it. Treat it in exactly the same way. I consider it a more free flowering annual than that plant in some localities. (See *Eschscholtzia.*

HYACINTHUS.—*(Hyacinth bulbs. For hill-stations and plains.)*

Nat. ord., Asphodeleæ.

These are splendid flowers, both single and double, and, though they do well in the North-West Provinces, are certain to meet with little success in Lower Bengal, unless grown under glass, and that well closed, so as to keep up a humid atmosphere. I draw the attention of those who cultivate the Hyacinth in Lower Bengal to this remark. They may be grown in pots of rich soil mixed with sand.

Culture.

The bulbs should be procured in October (early) from seedsmen. Whether grown in the plains or hill-stations, plant them just after they are received (which should be in October), from quarter to half the bulb being in the soil only, and place them in a dark room, or cover them with a half cask or a box. I may add, however, that the bulbs may be put down in the hills any time from October to February, or even March. See they are not dry; yet they must not be at first excessively watered. For a whole month they should be thus excluded from light. When they are exposed to light, the bulb should be almost entirely covered with sand and kept in a cool shady place. After having thus far proceeded with the culture of the Hyacinth in the plains, I think it would be advisable to grow them completely under glass. In the hills this will not be requisite; but should the flower stems not grow and elongate freely, a cone of paper may be placed over them, with the top open.

They may then be grown in moss, or cocoanut fibre chopped up, in a jardinette, by removing them very carefully and washing off all the earth and sand from their rootlets, so as not to injure them in the very least degree. When growing, they must be liberally watered, and should be placed in the dew in the open at night. When they are grown under glass in the plains, the glass should be removed at 6 P.M., and the pots placed in the open during the night, and they should be replaced in shade at sunrise and the glasses put on again.

I fully endorse Lieutenant-Colonel T. M. Shelly's views with regard to this treatment, having by this method grown Hyacinths most successfully under glass; and the same treatment is applicable to Narcissi, Jonquils and Tulips as recommended by him, though these latter are grown very easily in the hills, if put down early in October and watered well in beds, where they will be found to flower better than in pots. When the leaves have thoroughly withered, they may be twisted off, but the rootlets must not be cut off. They should then be put in dry sand and allowed to dry in the shade for six weeks, after which the dry portions of skin and rootlets may be rubbed off and the roots stored with their "crown downwards," and "not permitted to touch one another." Bulbs grown in sand, moss or fibre, when their flowers fade, must be planted out in open beds and watered well, after which they must be treated in the same way as bulbs grown in earth. Liquid manure is used beneficially in a weak solution when Hyacinths are in flower. Bulbs of Hyacinths should be procured fresh every year, as they are worthless the second season. These are in immense variety of all shades of colors to select from in seedsmen's catalogues.

Then there are miniature Hyacinths of varieties which are very effective, planted in vases, etc., filled with moss or sand, or for flowering in water in miniature glasses; and again single white Roman Hyacinths, which will be found to suit the warmer climate of the plains better than the ordinary sorts:

these should be planted by threes or fours in five-inch pots, making a pretty display. These increase rapidly and do very well indeed year after year. Clean all Hyacinth leaves with soap and tepid water most carefully: it is highly essential to them. Only support flower spikes when necessary and guard against changes of temperature.

HYDRANGEA.—*(Shrub.)*

Nat. ord., Saxifrageæ.

These, grown in the plains, form small shrubs, only fit for pots, but in cooler localities give every satisfaction, where they may be found growing from 4 to 5 feet high, as they are in England, and are really very handsome.

They should be grown in a rich soil composed of sand and a large proportion of leaf-mould and loam, with some cow-dung. Water them freely, as they are marsh plants. Propagated by division. *H. Hortensis* is the common Hydrangea, the flowers of which vary much in color according to the soil. One of the best fixed varieties of it is *Thomas Hogg*, which grows and flowers splendidly in the hills. *H. H. Nigra* is another very fine variety with immense flowers and heads, of which the flowers are pink. *H. H. Japonica:* blue of a lovely shade in this variety is, I believe, produced by some property in the soil, and can be produced artificially by watering with alum water and soap suds. It is the commonest variety in Darjeeling. *H. H. Otaksa* has a flesh-colored head of flowers. *H. H. Variegata* has ornamental leaves. *H. Paniculata* is a distinct species, bearing flowers in terminal panicles one foot or more long. There seems a good deal of trouble in rooting cuttings of this species. The flowers are small and star-shaped, borne in great profusion. *H. Petiolaris*, flower white, in a flat head 10 to 12 inches in diameter. *H. Quercifolia*, flowers white, in panicles; leaves lobed and toothed. *H. Scandens*, a climbing variety, flowers white. *H. Thunbergia*, flowers blue or rose.

HYDROCERA.

Nat. ord., Balsaminæ.

Hydrocera Trifolia.—A plant of aquatic habit, which bears large white flowers, variegated red and yellow, and with lanceolate leaves. Grow in a *gumlah* half filled with puddled earth, and keep quite wet till the seed germinates. Then add water as the plant grows, and always keep an inch or two of water over the soil in the *gumlah*. The flowers are produced continuously till cold weather sets in. Self-sown plants will come up the following year if the soil in the vessel be watered.

HYMENOCALLIS.—*(Bulbous plants.)*

Nat. ord., Amaryllidaceæ.

These are very handsome plants. Of these, *Ismene* and *Choretis*, which are included, there are about 20 species. They are of the easiest culture in the plains and hills. The bulbs should be buried in the soil to their full depth, and just appear above it and no more. The soil should be kept moist, especially during warm weather. *H. Amœna*, sweet-scented, flower white, tube green; leaves green with a thick mid-rib. *H. Andeana*, white, tube green, solitary flowers of large size; leaves long and narrow, pale green. *H. Calathinum*, white, very sweet-scented, 3 inches long; many flowers on scape, opening in succession. *H. Speciosa*, pure white, very fragrant. There are many others, but those mentioned are about the best.

HYOPHORBE.

Nat. ord., Palmaceæ.

Palms, natives of Bourbon and Mauritius Islands, of most handsome growth, with opposite or pinnate leaves. Flowers white, berries one-seeded, olive-shaped. *H. Amari-caulis*, trunks and petioles very stout, sometimes called *Areca Speciosa*; *H. Indica*, and *H. Verschaffeltii* are the only three species known.

HYOSCYAMUS.—*(Henbane. Annual.)*

Nat. ord., Solanaceæ.

Cultivate them as all other annuals. They bear buff bell-shaped flowers, prettily pencilled. Their leaves have a most disagreeable smell.

HYPERICUM.

Nat. ord., Hypericineæ.

1. *H. Chineuse* bears small yellow flowers at almost all seasons. The leaves are elliptical. Of easy cultivation. Propagated by division.

2. *H. Androsæmum* bears larger flowers than the preceding. The leaves are sessile, ovate and sub-cordate, minutely dotted.

3. *H. Pallens.*

4. *H. Patulum.*

5. *H. Elegans.*

Neither of the last three are of merit.

6. *H. Sinensis*, I believe, is to be found in the Agri-Horticultural Gardens, Alipur. I have not seen it.

IBERIS.—*(Candytuft. Hardy annual, sweet-scented.)*

Nat. ord., Cuniferæ.

The Candytuft is so called as it was originally introduced from the island of Candia. Few annuals are more effective, as they flower most profusely, especially the white varieties; in the plains, the colored varieties are more shy of flowering. Its seeds germinate most freely, and they are of easy cultivation. They may be sown in hill-stations in spring; but in the plains may only be sown in September, October and November. They enjoy a light rich soil; and they should be freely watered. Sow them where they are to remain in the border or in pots, as they do not stand transplanting well owing to their having long tap roots. The improved varieties

have exceedingly beautiful flowers. Water occasionally with liquid manure when the buds are forming and when the plants are flowering.

C. Carnea: flesh-colored.

C. Crimson.

C. Empress: pure white, very fine.

C. Lilacea: lilac.

C. Pink.

C. Rocket: white.

C. Sweet-scented: white.

C. White Tom Thumb: very dwarf.

ILEX.—*(Evergreen Shrub; the Holly.)*

Nat. ord., Ilicineæ.

The Holly will not succeed in the plains, but grows well in hill-stations, where it may be propagated by cuttings or from seed. *I. Paraguarensis* is cultivated in Calcutta gardens, and is known as Mate or Paragua tea. The leaves are obvate-oblong and bluntish. This plant is of no great interest in private gardens. *I. Aquifolia* is the English holly. *I. Dipyrena* is a native of India. *I. Crenata Fortunei* is a pretty variegated leaved variety of Crenata. There are some varieties indigenous to the hills of India, of which Dipyrena is one.

I. Aquifolium argentea medio-picta is a lovely variety, with a large blotch of white in the centre of the leaves.

IMANTOPHYLLUM.

Nat. ord., Amaryllideæ.

Named from the shape of its leaves being thong-like and leathery. This genus is now included under the head of Clivia, and is here mentioned as Imantophyllum, as it is generally known by that name. They are very handsome plants, which bear lovely flowers in broad corymbs. Their leaves are 1 to 2 feet long and narrow, arching and deep green,

broadly sheathed at the base. They are best grown in tubs or large pots, in a grass conservatory, in a compost of fibry loam, leaf-mould and charcoal, and it is said bone-dust benefits them, because the plants seldom require re-potting. A season of rest in winter is beneficial to them.

I. Itonia syn. *Clivia Nobilis:* red, yellow; about 50 flowers in a drooping umbel.

I. Cyrtanthiflorum: flowers very rich salmon color, very large, with a light centre.

I. Gardeni: yellow or reddish orange.

I. Miniatum: deep orange.

The second and third mentioned have been introduced to India. They are best propagated by division, for the bearing of seed has a very weakening effect on them.

IMPATIENS.

See *Balsam.*

INDIGOFERA.—*(Indigo : a Shrub.)*

Nat. ord., Leguminosæ.

All indigo plants are shrubs with pinnate leaves of small pairs of leaflets. Many of them are natives of India. A few of them may find a place in the garden. Not interesting as garden plants. Propagated from seed.

I. Atropurpurea: 6 feet; purple flowers.

I. Violacea: 4 feet; rose-colored flowers.

INGA.

Nat. ord., Leguminosæ.

These plants have leaves abruptly pinnate, rather large and handsome; the plants are of rapid growth and straggling, and require to be well pruned in to keep them within bounds. Propagated by seed sown during the rains.

I. Dulcis: useful for hedges; commonly known as Manilla Tamarind. Pods curiously twisted,

said to be a good food for cattle. Flowers insignificant.

I. Haematoxylon: tassel flower. Flowers scarlet.

I. Samon: Rain tree: a large tree, said to fertilize soil.

IPOMŒA.—*(Creepers, some Annual, others Perennial.)*

Nat. ord., Convolvulaceæ.

Ipomeas are all creeping plants; some of these are extensive climbers, so much so as to cover large trees to their tops. They are most useful for covering trellises, and many of them are very handsome.

I. Bona-nox: white.

I. Filicaulis: white or cream colored, bright purple in the throat.

I. Hederacea: light blue color, calyx hairy.

I. Horsfalliæ: rose color, glossy.

I. Pandurata: white with purple throat.

I. Purpurea, or *Convolvulus major* of seedsmen's catalogues: many flowered, colors various.

I. Quamoclit: leaves very finely pinnate (filiform); flowers dark red, solitary. There is a white flowering variety of this, not quite so common.

I. Rubro-cœrulia: a beautiful large azure blue flower; an extensive climber. Sow seed in July in the plains and in the hills in May. The white variety is not so handsome.

These may be grown in any ordinary garden soil, and do not require any particular treatment.

IPOMOPSIS.—*(Biennial plants, now included under the head of Gilia.)*

I keep these separate here, as they are biennials, and rather pretty plants; Gilias are less so.

If the plants are kept over to the second year they flower prettily. *I. Elegans:* its flowers are bright scarlet. Sow seed in the plains and hills in October.

IRESINE.

Nat. ord., Amaranthaceæ.

These plants are of little merit except for edgings to flower beds. *Herbstii, Acuminata, Aureo-reticulata, Lindenii.* They are easily propagated by cuttings put down in the rains. They are of dwarf growth and with inconspicuous flowers. Their leaves are of a dark crimson color or red, and sometimes variegated, as in *Aureo-reticulata*, which is pretty.

IRIS.—*(Bulbs or Rhizoms.)*

Nat. ord., Iridaceæ.

These plants rival in beauty the handsomest and rarest orchids, and among floral beauties stand prominent in the list of those which should decorate our borders and conservatories. The height of the plants is from eighteen to twenty-four inches. The cultivation is extremely simple, and no plant is more effective when planted in clumps of threes or fours, becoming more so each succeeding year if left undisturbed. Roots of Iris should be procured at the same time as Hyacinth bulbs, or they may be procured from hill-stations and planted out in the border. They may flower the first season if left undisturbed, but if they do not, many of them may flower the second season. They should be watered well when they begin to grow. It is said of the Paxtonian section of the English Iris (which will do well in hill-stations, while some of them will succeed in the plains, grown in a grass-house or conservatory) that *en masse* they show a display of the most striking combination of the richest colors to be met with in flowers. Some of them are sweet-scented. Below are the names of a few:—

I. Chinensis: violet-blue flowers.

I. Pavonica: white with blue spots. A lovely flower.

I. Persica : light blue and yellow; sweet scented.

I. Nepalensis : azure-blue flowers.

I. Susiana, or *Widow Iris :* bluish-tinted brown, netted with veins or spots.

I. Germanica : colors various.

I. Xiphium, or *Spanish Iris.*

I. Xiphioides, or *English Iris.*

I. Lævigata or *Japanese Iris :* both single and double of all colors. I have had these in beautiful flower in the hills. They require a season of rest in winter, and if planted in a bed require little or no protection during that time. I find they do best if planted out, when they flower much more freely in beds, like all Iris do, in the hills. They are shy bloomers when grown in pots.

The varieties comprise a long list of names too numerous to be mentioned here, but a good assortment can be got from any respectable florist.

Their roots are bulbs or rhizoms, and should not be kept out of the ground for any length of time, but planted as soon as obtained in well-drained and capacious pots, in the conservatory or grass-house, and those that will do out-doors (such as *Susiana*), planted by threes or fours in the border. The soil best suited to them is a light sandy soil well manured with cow-dung. Propagated by division. They should be watered well when in growth. They flower at various seasons and enjoy shade.

ISMENE.—*(Peruvian Daffodil.)*

Nat. ord., Amaryllideæ.

These are much like Pancrateums and require the same treatment, and in this country are very easily cultivated. They increase rapidly in numbers and flower prettily if left undisturbed for two or even three years. *I. Calicanthina.*

IXIA.—*(Bulbous plant.)*

Nat. ord., Iridaceæ.

All of these are pretty Cape bulbs. They should be procured in October and treated at first just as Hyacinths are, and watered sparingly till they send up their green shoots. When planted in the garden the bulbs should be put four inches deep in loam which should be made light with sand. Plant them four inches from each other. Their colors are as equally varied as they are rich and beautiful. They succeed well in this country. Grown in pots the bulbs should be planted only two or three inches deep. In the dry climate of the North-West Provinces, in the hills, during the months of March and April, they are liable to suffer if grown in the open beds: so are better grown in pots or boxes. They have flowered well with me in the hills year after year, and also on the plains. *The Czar*, scarlet, black eye. *Wonder*, double pink. *Grand Duc*, pure white, purple eye. *Golden drop*, *Admiration*, lemon, with blotch. *The Bride*, white. *Hubert*, rosy maroon, and many others.

IXORA.—*(Shrub.)*

Nat. ord., Rubiaceæ.

The Ixoras comprise a numerous list of very handsome flowering shrubs, all of which thrive well in India. They grow in any garden soil, and are propagated by division of layerings and cuttings, while a few yield seed from which they may be propagated.

I. Acuminata: pale green leaves, white flowers, fragrant.

I. Alba: a small choice shrub, white flowers. One of the best.

I. Lanceolaria: greenish-white flowers, very choice.

I. Crocea: orange flowers; a small shrub, rare in this country.

I. Ragoosula: rose-colored flowers.

I. Barbata: long-tubed white fragrant flowers; large leaves, nearly a foot long.

I. Grandifolia or *Grandiflora:* very large leaves and immense truss of flowers (rare).

I. Hydrangeœformis: rare, with rich yellow and orange flowers.

I. Coccinea: bright scarlet flowers; the common variety.

I. Incarnata: native of China, flesh-colored flowers (propagated by inarching only).

I. Cuneifolia: a small tree, with white flowers in trusses, like balls, which are fragrant; very handsome.

I. Javanica: very choice orange-scarlet flowers. This plant must be protected from cold, which it cannot stand.

I. Prince of Orange: choice orange flowers.

These are among some of the handsomest shrubs we have in our gardens. There are many species and varieties.

JACARANDA.

Nat. ord., Bignoniaceæ.

These plants are fern-like in appearance, with opposite leaves bipinnate.

J. Chelonia, J. Mimosifolia, J. Tomentosa: best, I think, grown in grass conservatories. Propagated by seed and by layering. *J. Mimosifolia* and *J. Mimosifolia fl. alba:* the first bearing blue and the second white flowers, are handsome plants.

JACQUINIA.

Nat. ord., Myrsineæ.

Shrubs with scattered leaves ending in a needle-like point. They bear tubular star-shaped flowers.

J. Armillaris : white, in racemes.

J. Ruscifollia : bright orange.

J. Aurantiaca : bright orange.

Increased by division and by cuttings, which are difficult to strike, as the wood is hard.

JASMINUM.—*(Jasmine. Shrub.)*

Nat. ord., Jasminaceæ.

Jasmines include a numerous genus of species, of which I only mention those most deserving a place in the garden.

It is best to prune them in after flowering, especially those which are extensive plants. They are all easily propagated from cuttings or layerings taken during the rainy season. They grow well in any garden soil enriched with manure.

J. Augustifolium : a twining slender shrub with small grossy leaves growing in pairs. Bears small white star-like flowers, which are very fragrant; good to place over an arbour or summer-house.

J. Arborescens : a tree about ten or twelve feet high; bears, during the hot season, numerous white, sweet-scented flowers.

J. Grandiflorum : small but spreading shrub, known as "kuthbela" by natives; troublesome, as it spreads so rapidly. This plant has very fragrant white flowers (rather too much so to be agreeable).

J. Officinale : this is the ordinary Jasmine of our garden, with white fragrant flowers; a small, twining and graceful shrub.

J. Sambac (is the "*Bel*" or "*Bela*," so called by the natives of this country): a small shrub, with rich green polished leaves. The flowers are white, and both single and double scented, too much so for European tastes.

J. Scandens: a creeping shrub, with large leaves and white flowers, which are fragrant.

JATROPHA.—*(Coral plant. Shrub.)*

Nat. ord., Euphorbiaceæ.

J. Multifida: this is a herbaceous shrub, with pretty leaves, much divided. It bears small flowers resembling bits of red coral, which are succeeded by large seeds, from which it can be easily propagated and grown in any ordinary garden soil in open beds or borders.

J. Panduræfolia: a shrub of moderate growth, with fiddle-formed leaves. The flowers are of a bright crimson color, and are succeeded by seeds, from which it may be propagated, or by cuttings. There is a variety with rose-colored flowers. This plant may be grown in any ordinary garden soil, and requires no particular attention.

J. Integerrima: flowers red.

J. Podagra: orange red.

JONESIA ASOCA.—*(A tree.)*

Nat. ord., Leguminosæ.

These are highly ornamental trees, which are found in many of the hilly districts of India. It bears flowers, which Firminger aptly compares to large trusses of Ixora. Nothing can be more handsome than this tree when it is in full bloom.

It is easily propagated from seed, which it bears in abundance.

JUGLANS REGIA.—*(The Walnut tree.)*

Nat. ord., Juglandaceæ.

Every one knows the walnut tree with its pretty foliage. It is easily reared from seed; but the plants will not grow in

the plains. In the North-West Provinces, among the hills, very superior walnuts are grown, some of them with very thin shells.

JUNIPERUS.—*(The Juniper. Small shrub.)*

Nat. ord., Coniferæ.

These plants are well known as ornamental shrubs. They are propagated by cuttings and layerings. They grow in almost any soil with no care.

J. Cernua.
J. Chinensis.
J. Communis.
J. Dimorpha.
J. Aurea.
J. Variegata.

They are all slow-growing shrubs.

JUSTICIA.—*(Small shrub.)*

Nat. ord., Acanthaceæ.

J. Coccinea is a shrub about four feet in height, very ornamental, with crimson flowers two inches long; *J. Carnea* is a choice plant, about three feet high, with rose-colored flowers in clusters; and *J. Calycotricha* bears lemon-colored flowers: they all grow in any garden soil well enriched with manure, and are propagated by cuttings and layerings, as well as from division.

J. Gendarussa.
J. Grandifolia.
J. Argentea.
J. Manorata.
J. Calcotricha.
J. Betonica.

KALANCHŒ.

Nat. ord., Crassulaceæ.

A plant of no great merit, herbaceous, with succulent leaves. Propagated by cuttings put down at the close of the rains.

K. Heterophylla : bright yellow flowers.

K. Lacinata and *K. Varians :* leaves divided, much like the above.

K. Farinacea : flowers scarlet, in umbel-like heads. Leaves round.

K. Grandiflora : flowers yellow, rather large. Leaves succulent, opposite, sessile and ovate.

KALMIA.

Nat. ord., Ericaceæ.

These are grown in the hills, but are quite unknown in the plains. *K. Califolia :* this is known as the Calico-bush. Flowers white or rose-colored, in dense terminal corymbs. Leaves bright green and elliptical-lanceolate. They thrive in good turfy loam and leaf-mould, with good drainage. Propagated by cuttings. *K. Glauca :* lilac-purple flowers.

KAMPFERIA.

Nat. ord., Scitamineæ.

These are tuberous-rooted plants, many of them with very pretty delicate colored flowers of various tints of coloring. The first two species are the most common in our Indian gardens. They have tuberous roots, and bear their flowers close to the ground, so are better grown in pots to be raised to view. Grown in the borders, their roots are not unfrequently dug up or lost.

While in growth they should be copiously watered When their flowers are over, water should be withheld, when the eaves seem to be turning yellow.

K. Rotunda : the flowers of this species appear first, before the foliage. Flower sweet-scented, white and reddish violet. Leaves oblong. They die down in November.

K. Galanga : Flowers white and purple, scentless, and borne just above the leaves, which are ovate, sessile. This species flowers all through the rains.

K. Parishii : white, bright purple spots; leaves pale green. *K. Ornata :* yellow and orange; leaves long-stalked, acute-lanceolate, deep green, with a silvery band in centre and purple below. A handsome species. *K. Gilbertii :* a foliage species, leaves undulating at the margins and deeply bordered white. *K. Bensonæ*, *K. Rosceana*, *K. Undulata*, and *K. Kirkii :* yellow, sweet scented.

KAULFUSSIA.—*(Annual.)*

Nat. ord., Compositæ.

A beautiful little annual, which in the plains should be sown in pots in October, and planted out in beds or mixed borders. In hill-stations they should be sown at the same time with other annuals in pots, and transplanted in the same way as in the plains. They require a good rich soil.

K. Amelloides : bright blue; ½ foot.

K. Rosea : rose, with mauve centre; ½ foot.

K. Alba : white; ½ foot.

KENNEDIA.

Nat. ord., Leguminosæ.

These are bean-like climbers or prostrate plants. They thrive up-country very well, but do not grow in lower Bengal and about Calcutta.

They are rapid growers, and do well in partial shade.

The seed should be sown after the hot west winds are over, or say about the close of April. *K. Prostrata Marryatæ :* flowers light scarlet. *K. Rubicunda*—dark red—are the best species.

KENTIA.

Nat. ord., Palmæ.

A handsome genus of palms; they require plenty of pot room and water. In appearance they are much like Arecas. *K. Baneri, K. Belmoreana, K. Costata, K. Australis, K. Macarthurii, K. Robusta, K. Sapida, K. Wendlandiana* and others.

KERRIA JAPONICA.

Nat. ord., Rosaceæ.

These do very well in the hills in almost any soil, and are about the first flowers that appear in spring. Flowers like deep orange double roses, with many petals. The single flowered variety flowers all the year round; the double only in spring. Propagated by cuttings and by division.

KIGELIA PINNATA.

Nat. ord., Bignoniaceæ.

Rather a coarse tree, bearing bunches of maroon-colored flowers at the end of long rope-like stems, quite five or six feet in length, succeeded by long cucumber-like pods.

Easily propagated by seed sown in the rains in the plains.

KLUGIA NOTONIANA.

Nat. ord., Gesneraceæ.

I have not seen this plant, but Firminger says it is "remarkable for the snail-like twist of its leaves, and its bright small blue flowers." It blooms in the cold season. Its seeds should be sown in October in the plains, and April in the hills, and the pots kept in pans of water after the seedlings are transplanted.

KONIGA.—*(Sweet Alison or Allyssum. Annual. Sweet-scented.)*

Nat. ord., Cruciferæ.

These are small annuals, bearing small white flowers in heads, and are sown in patches in the border in the plains in October, and in hill-stations at the same time with other annuals.

KNIPHOFIA, TRITOMA, TRITOMANTHE OR TRITOMIUM —*(Flame lily. Red hot poker flower or flame flower.)*

Nat. ord., Liliaceæ.

The name this plant is generally known by is Tritoma, but Kniphofia is a prior one, as it was called after Johann Hieronymus Kniphof, a professor of medicine in 1704 to 1763 at Erfurt.

There are about sixteen species of these plants, all natives of tropical Africa and Madagascar

They are most showy, bearing mostly yellow, orange, red or scarlet flowers. They are of easy cultivation either in the plains or hills, but at high altitudes, where the frost is intense, they require some leaves, sawdust or manure to be thrown over them to protect them. They are best planted in a sandy soil with a top dressing of old manure, and require copious watering during their growing season in spring and summer. In the plains they will do in open beds, but are far more ornamental and grow better in grass conservatories.

K. Aloides is the common torch lily. Its leaves are very long, narrow, toothed on the edges, and keel-like, like most or all of the species. The flowers are large, tubular, coral-red, fading to an orange color. Spike of flowers 3 to 4 feet. *Syn K. Uvaria* and *K. Tritoma Noaria. K. A. Maxima* bears larger flowers, coral-red, and the flowering spike is much taller; sometimes known as *Grandis. K. Caulescens:* flowers reddish-salmon, later on white, tinged greenish-yellow. *K. Corallina* is a comparatively new garden hybrid with a very fine spike of flowers, coral-red. *K. Hybrida H. Cannell:* orange scarlet, shaded pale orange. *K. Hybrida Victor Lemoine:* golden yellow, very fine. *K. Hybrida Mr. R. C. Affourtit:* highly colored seedling from *Corallina*, very floriferous. *K. Modesta* and *K. Pallidaflora:* white. Only one or two species of Kniphofias are of this color *K. Paucifolia:* yellow, dwarf. *K. Longicollis:* yellow, only suitable to the hills; winter flowering. *K. Leichlini:* vermilion-red, dwarf. The crowns

should be left undisturbed during the season of rest. Propagated by division of the crowns, or by seed when it can be procured.

KORTHALSIA.

Nat. ord., Palmaeæ.

These palms are closely allied to Calamus, natives of the Malayan Archipelago and New Guinea. A genus of about sixteen species. Only a few plants of these are to be found in Calcutta, perhaps because they are so like Calamus.

K. Junghuhnii: the leaves long-stalked, ending in a tendril-like shoot or process. *K. Scapigeria:* leaves pinnate, rachis armed with short spines and tendril armed. Young leaves covered with white hairs (tomentose). (Andaman Islands, Malaccas.)

LABURNUM.

Nat. ord., Leguminosæ.

The leaves of this tree are digitately three foliate, and flowers in long terminal racemes, pea-like, yellow. This tree does not succeed in the plains at all. I know of only two or three small trees in Mussoorie. They seem to damp off in the hills, during the rains, when young. When a little older they grow on well. If residents in the hills wish to grow them, they must grow them in pots for a couple of years, and then plant out. They will be able thus to resist the rains *Laburnum Vulgare Watereri* is the best variety of the Vulgare. It has very long racemes, and is very floriferous. Golden of the deepest coloring. *L. Adami:* dull purplish color.

LACHENALIA.

Nat. ord., Liliaceæ.

These are small tunicated bulbous plants, which are exceedingly pretty. Some of them are rare, but one of

the best is *L. Tricolor*, common enough, as also *L. Aurea* and *L. Nelsoni*. The latter is especially fine. They are cultivated in the plains, but with some difficulty, as they are seldom seen. I have not tried them in the plains In the hills they do very well, and they should succeed in the North-West Provinces. Propagated by division of bulbs, by which they increase rapidly. They should be grown in loam two parts to one of leaf-mould, and placed in the pots they are to flower in at once. They must not be transplanted. A little cow manure may be added to the compost, but not much. When in flower add a little artificial manure, or water with liquid manure, but take care it does not touch the leaves.

The bulbs should produce from one to four spikes and should be planted in groups in pots, the number of bulbs being regulated in accordance to the size of pot. Draughts must be avoided: they stunt the growth and injure the foliage. If these instructions be followed the cultivation of Lachalias is an easy matter. They do not require heat, and if cultivated in the plains, should be grown in a cool and shady corner of a grass conservatory. The bulbs should not be disturbed in the pots, and should be put down as soon as obtained, in the plains in October, and in the hills in January, February or March. Good drainage is essential to them, and a good open soil, as pointed out above, is necessary. *L. Fragrans:* very sweet-scented flowers, about twenty on a raceme, red. Leaves oblong. *L. Lilacina:* flowers about twenty. Calyx lilac, blue at the base and petals blue. Large flowers, wide spreading. Leaves lanceolate. *L. Nelsoni:* golden yellow flowers, in long racemes, very numerous, very handsome. *L. Odoratissima:* flowers in dense racemes, white with greenish tip; petals white, very spreading. Leaves only two lanceolate, fleshy and blistered, 6 inches long, ½ an inch broad or a little more. *L. Pendula:* flowers produced on a spotted scape, which is stout growing. Flowers deep purple, red and yellow. Leaves erect lanceolate,

slightly spotted. *L. Purpurea-cœrulia:* thirty to forty flowers in a raceme, purplish-blue. Leaves two, sometimes three, fleshy, blistered, lanceolate. *L. Tricolor:* flowers all along the upper part of a scape, red, yellow and green. Leaves in twos, spotted purple, lanceolate. *L. Violacea;* flowers white, tinged violet and green; leaves two, fleshy, lorate, 8 inches long, 1½ inches broad. *L. Rubida:* flowers tube-shaped, of a ruby red, on a thickly spotted scape; leaves in twos, slightly spotted. *Punctata:* a variety of the last, has a pale ground color, thickly spotted deep-red.

These should be much more common than they are, in the hills especially, and it is a pity that seedsmen do no import the bulbs.

LAELIA.

Nat. ord., Orchideæ.

See *Orchids.*

LAFONENSIA.

Nat. ord., Lythrarieæ.

L. Vandelliana: A small tree, one of a genus of eight species. Leaves oval, smooth, leathery, and a shining green. Flowers, as Firminger describes them most aptly Lagerströmia, like *L. Microphylla* or small leaved, elliptic-shaped and leathery; flowers reddish-brown.

The plants grow about four feet high, and require to be pruned after flowering. They are propagated by seed and cuttings put down in the rains.

L. Elegans has large leaves and light purple flowers in huge panicles, very handsome. *L. Reginæ*, a tree with flowers much like the last. I have seen these very beautiful trees in the forests in Chittagong, in the Hill Tracts, where they grow most luxuriantly. See Lagerströmia, under which head it is known in this country.

The timber of this tree is very good and valuable. Handsome for parks, and known as "*Jarul*" to Natives.

LAGERSTROMIA.—*(Shrub.)*

Nat. ord., Lythraceæ.

Lagerströmia Indica is a very ornamental plant; when it flowers during the rains, with masses of bloom, it is an object of great beauty. There are rose-colored, white, and lilac varieties, all very pretty. They grow well in any good garden soil. Propagated by layerings or cuttings put down in the rains, or plant seed.

L. Indica: flowers rose-colored, very handsome.

L. Flos-reginae or *Jarul* tree of India: a tree of good size; very handsome flowers of a fine rose color. A useful tree for its wood. A moist hot climate suits it. Some trees bear purple flowers. Properly this is called Lafonensia.

L. Elegans: very handsome, with purple flowers.

L. Elegans alba, of smaller growth, with white flowers, and very pretty.

LANTANA.—*(Shrub.)*

Nat. ord., Verbenaceæ.

L. Trifolia: a not very attractive plant, bearing lavender-colored flowers, succeeded by berries of a similar color.

L. Selloviana: a pretty plant, much like a Verbena in habit. It has pale purple flowers followed by blue berries.

L. Nivea bears lavender-colored flowers with a yellow centre; very pretty.

L. Aculeata (Wild Sage) has orange-colored flowers in semi-spherical heads.

The two last are large shrubs. All Lantanas have leaves with a sage-like scent, which is very powerful. They flower all the year round.

Propagated by seeds and cuttings.

LAPAGERIA.—*(Creeper.)*

Nat. ord., Smilaceæ.

L. Rosea. This is a most beautiful creeper, which may be propagated from seed; few climbing plants are so handsome,

showing a great profusion of bell-formed pendant flowers of a rose color, spotted with white. It may be grown from baskets or rustic work, or in pots with a bamboo trellis-work. They are best when planted in a bed, of which the drainage is good. This is an important point in their cultivation, and a start made with good, healthy, strong plants. Weak plants are better weeded out. Loam, cocoanut coir and some sand is the compost they should be grown in.

Their roots must be enclosed within a space surrounded by slates or brick tiles to within a square yard, or they send out suckers. In the plains they must be grown in a plant-house, and be shaded, during great heat, almost entirely.

They are best, however, suited to the hills, as they require to be kept cool in March, April and May. Plenty of water must be given to them while growing, and syringing is highly beneficial till the flowers open. Attacks of greenfly must be carefully warded off. They are most liable to it. *L. Rosea:* rosy crimson; leaves lanceolate-ovate pointed, alternate, reticulately veined, with three to five nerves. *L. Alba:* white, a lovely variety. *L. Rosea alba:* a variety with very large flowers, crimson.

LAPORTEA.

Nat. ord., Laurineæ.

Comparatively lately introduced to Calcutta. There are about twenty-five of this species, formerly belonging to the Nat. ord. Urticaceæ. Their leaves are alternate, often large, beautiful and toothed. Propagated by seed or by cuttings put down in sand during the rains.

L. Schomberghii-versicolor. The leaves are large, deep green, mottled greyish white and patches of creamy white, alternate, on fleshy petioles, one to two inches long, deep port wine color, continued into the mid-rib of leaf and chief veins. Sometimes the white is over the entire side of a leaf. This is the species in Calcutta at present. A very handsome plant, and probably the best.

LASTREA.

See *Ferns*.

LATANIA.

Nat. ord., Palmæ.

A small genus of palms, with fan-shaped leaves, native of the Islands and Mauritius. They are rather difficult to grow in India. Propagated by seed. *L. Commersonii:* leaves are gracefully incised and curved, segments margined, reddish chocolate-colored band, and edged with fine spines. Stem smooth and slender. *L. Aurea, L. Bourbonica, L. Glaucophylla, L. Loddigesii, L. Verschaffeltii,* are all species well worth growing.

LATHYRUS.—*(Creeper. Annual and Perennial.)*

Nat. ord., Leguminosæ.

L. Sylvestris platyphyllus or *Lathyrus latifolius*, or the Everlasting Pea—Is easily raised from seed, but does not flower well in the plains of Lower Bengal, though it flowers freely further up country and in hill districts. They require to be slightly sheltered from excessive rain and the great heat of the warmer months. Flowers numerous, rose-colored.

Lathyrus odoratus, or the Sweet Pea.—A most beautiful annual, remarkable for the fragrance of its blossoms, which are of various colors. It is sown at the same time as other annuals in the plains and in hill-stations. Or in the hills it may be sown in October to flower in spring, and in that case requires to be slightly sheltered with grass in winter; or it may be sown in January, February or March to flower in summer and autumn. It requires a light soil. Soak the seeds in water and then plant them where they are to remain, either in rows or circles, and when they grow support them with sticks neatly placed in the same manner as for the edible pea, and tied at the tops; there are a great many varieties.

I think these should be sown separately when seed is to be kept from them for acclimatization, as it will be found there will be a tendency for the scarlet varieties to predominate, or if white sweet peas are planted in the lot, the lighter colors will predominate. Sweet peas have been much improved lately, and a great many lovely varieties produced some of a fine blue color. The Himalayan Seed Stores, Mussoorie, have a very choice selection of these. They are largely of American origin. These are among the finest novelties and well repay the amateur, as they are so easily cultivated.

White Cupid Sweet Pea is quite a new departure, flowers pure white, very floriferous and only five inches high, very bushy; and also *Pink Cupid*, which is dwarf. *Blanche Ferry*, *Emily Henderson*, *Prima Donna*, *Golden Gleam*, *Mars*, *Captivation*, *Countess*, *Maid of Honor of Radnor* improved, *Captain of the Blues*, *Mrs. Joseph Chamberlain*, *Golden Gate*, *Venus*, *Her Majesty*, *Countess of Aberdeen*, *Gray Friar*, *Emily Eckford Creole*, *Juanita*, *Aurora*, *Monarch*, *Ramona*, *Stanley*, *Butterfly* improved, *Royal Rose*, *Lady Pensance*, *Columbia*, *California*, *Coronet*, *Minnehaha*, *Emily Lynch*, *The Bride*, *Countess Powis*, *Prince Edward of York*, *Queen Victoria*, *Salopia*, *Shazada*, *Triumph*, *Waverly*. These are the pick of the finest new introductions, and a very great advance in color, form and size.

Lathyrus Tingitanus, or Tangier Pea—Flowers best in the North-West Provinces and hill-stations, and is raised from seed.

LAURUS.

Nat. ord., Laurineæ.

Of this genus there are only two species—*L. Nobilis* and *L. Sassafras*. They grow on the hills, but not on the plains. Leaves oblong-lanceolate, acute, and feather-veined. There are some varieties with variegated foliage, curled and Willow-shaped leaves.

LAVANDULA.—*(Lavender. Shrub. Sweet-scented flowers.)*

Nat. ord., Labiatæ.

L. Spica.—These are pretty shrubs, easily raised from seed, and kept on from year to year. Firminger says, he has not heard of its flowering in the plains. I have repeatedly had it in splendid flower in Behar and elsewhere in the plains, covered with spikes of bloom. The plants have silvery green foliage, and thrive well in the plains in a light soil richly manured with leaf-mould only, and well watered, especially during the flowering season and in the hot weather. It will be all the better for being protected from the sun during the hot season, though this is not absolutely necessary, but protect from the rains where the rainfall is very heavy.

LAVATERA.

Nat. ord., Malvaceæ.

L. Tremestris.—An annual well suited to gardens, about 2½ feet high, bearing rosy pink flowers. Easily grown almost anywhere. In the hills sow in March or April, also in October, and hold over for flowering in spring. In the plains sow in October. *L. Tremestris:* rose-colored flowers.

LAWSONIA ALBA.—*(Henna. A shrub. Sweet-scented flowers.)*

Nat. ord., Lythraceæ.

L. Alba.—I have seen this shrub grow to the height of ten or twelve feet in the plains. Its foliage is of a greyish green, neat and small. When in flower, with its panicles of greenish white flowers, it scents the whole garden with its fragrance, which is powerful and agreeable. It makes a most excellent hedge, which is quite impenetrable, as it is a thorny shrub and compact, when cut and made to grow thickly. It is easily propagated by cuttings put down during the rains, and may also be propagated by seed, which it bears abundantly.

LEDENBERGIA,—ROSEA OR ROSEO-ÆNEA.

Nat. ord., Phytolaccaceæ.

There is only one species of this genus. The flowers are whitish or rose-colored, and borne in drooping axillary racemes.

The leaves are large, alternate, leathery, obvate-lanceolate, of a dark coppery shining green above and of a bright rosy violet beneath. The stems and branches are of a reddish purple. Propagated by cuttings during the rains.

LEEA.—*(Herbaceous plant.)*

Nat. ord., Vitaceæ.

Leea coccinea or *Leea sanguinea.*—A plant which is exceedingly pretty in the rains, with crimson flowers and berries. It may be propagated from seeds or cuttings. The leaf of this plant is lanceolate and foliage pinnate. *Leea amabilis* is a very different plant, with pretty bronzy green foliage, with a white stripe down the centre, rather broad. The reverse of the leaf is claret red, with a green stripe down the centre. A native of Borneo.

LEMONIA.—*(Shrub. Sweet-scented.)*

Nat. ord., Rutaceæ.

L. Spectabilis is a pretty shrub, with rich green polished leaves about two inches long, which are fragrant when crushed, like Fraxinella. It bears bright crimson pink flowers, and remains in bloom a long time. It should be well watered, and sheltered from the sun. It produces seed in abundance during the cold season, from which it may be propagated. There is a variety with pale pink flowers.

LEPTOSIPHON.

Nat. ord., Polemoniaceæ.

Very charming little hardy annuals, with many small button-like flowers in clusters. Foliage in dense feathery tufts. *Leptosiphon androsaceus*, purplish rose. There is also

a variety with white flowers. Sow seeds in October in the plains, and October or March and April in the hills. *L. Roseus*, rose-colored.

LEPTOSPURMUM.

Nat. ord., Myrtacea.

L. Lævigatum.—Very pretty flowers, borne close to the leaves all along the stem. Leaves narrow, oblong, obtuse, half to three-quarter of an inch long. Propagated by seed or cuttings. Syn. *Fabricia Lævigatum.*

LEUCOJUM.—*(Snow-flake. Bulbous plant.)*

Nat. ord., Amacyllidacæ.

Very pretty hardy bulbs, which bear spikes of flowers much like large flaunting snow-drops. *L. Aestivum* (the summer snow-flake); *L. Vernum* (the spring snow-flake). The former blossoms in May in England, and the latter in March. The last-mentioned is considered the most valuable, and forms a nice plant for the aquarium, or in pots or beds, while it may be made to flower earlier by forcing. These do well in the hills, and *Æstivum* does well in the plains or hill. They require a rather light loam and free watering when in growth. If the bulbs are planted in pots and kept in-doors in a warm room, they will be forced to flower very much earlier than they would out of doors.

L. Pulchelum: flowers large, white.

L. Carpaticum: white sweet-scented bifloral species.

LIATRIS.—*(The blazing star or gay feather of Kansas.)*

Nat. ord., Compositæ.

These are biennials and will only do in the hills. Sow the seed in October and hold over to the following season to flower. They are very pretty, with fine grass-like leaves, and flowers produced on a spike about three feet high. They can be grown well in pots in almost any soil.

LICULA.

Nat. ord., Palmæ.

These palms are very handsome, with fan-shaped leaves and prickly stalks. They are all of easy cultivation and most useful for the decoration of our grass conservatories; among them *L. Grandis*, now known as *Prichardia*, *L. Acutifida*, *L. Peltata*, *L. Rumpii*.

L. Prichardia is probably the handsomest and most choice of them all.

LILIUM.—*(Lily. Bulbous plant.)*

Nat. ord., Liliaceæ.

These are exquisite floral beauties. Firminger writes he procured bulbs while at Ferozepore and Howrah, "but on each occasion met with most unsatisfactory results;" on the other hand, I received bulbs from England, when in Behar, of *L. Longiflorum*, which gave me finer flowers than I have seen in England, and I have counted as many as eighteen flowers and buds on one flower stem. These plants were grown under the shade of a *Casuarina* tree in open beds, and I would recommend their being cultivated in the same way, or in a grass-house, when there are many bulbs at hand. The soil should be mixed with a little sand with lots of leaf-mould and a little cow-dung, but beware of earth-worms, which destroy the bulbs; if you have artificial manure, use it in preference; and this should be used if the plants are grown in open beds or pots. Frequent waterings with liquid manure are beneficial when the plants are growing and in flower, and pure water should be liberally used every day. After flowering, water should be withheld by degrees, and the flower stem, when dry, cut off just above the ground. After this the bulbs may be taken up carefully and stored away in earth, but never be allowed to get quite dry.

If plants are reared in pots the drainage should be perfect, to admit of their growing in perfection. One large

bulb only should be planted in a pot of 10 inches in diameter, or two or three small ones, according to their size. The bulbs in pots should be planted from three to four inches deep in the compost. Their flowers are white and fragrant. They enjoy partial shade, and just such shade as a *Casuarina* tree would afford is good for them.

L. Wallichianum grows wild in the hills at Mussoorie, and the bulbs should be obtained when they have matured and the first touch of frosty weather has set in, or they will not flower. *L. Poliphyllum* is also found wild in the hills at Mussoorie. The former bears very large and handsome white trumpet-shaped flowers, the latter smaller white flowers, spotted and dashed with crimson. *L. Wallichianum Nelgeriensis*, I think, bears, if anything, the larger flowers of the two varieties of Wallichianum.

L. Auratum, the Golden-banded Lily, bears flowers 10 to 12 inches in diameter, pure white, with a yellowish band through the centre of each petal, and covered with brownish dots. It is deliciously fragrant. One stem often produces six to ten immense blossoms. In hill-stations, during the winter seasons, spread some dried leaves over the beds they are planted in if grown in open ground. Bulbs, when planted out of doors, should not be planted less than five or six inches under the garden mould. The bulbs must not be disturbed, when intended for established patches, in less than three years; and they should be started in May in small pots, and then planted in beds which they are to occupy. If the soil is of an adhesive nature, two feet of it should be removed and replaced with rich free soil. By not removing the bulbs they will flower much more profusely than those taken up and divided. Great care must be taken to avoid their most deadly enemy earth-worms. In a soil infested with them, nothing will, to my knowledge, keep them away. Then they must be grown in pots only. I have a fine collection of Lilies, but only use a little manure,

as I find earth-worms so destructive. Heavy rain will not injure the bulbs; strong sun heat dries them, and they should be shaded while growing and flowering. They should be properly watered during the time of their flowering. To bring them to perfection I would advise their being shaded while in growth and in flower. This is applicable to all Lilies grown in hill-stations in beds or in pots. They multiply themselves, and are propagated by division and by seed. The best varieties for culture are named below :—

L. Balemannæ : rich apricot.

L. Kamschatkiense or *Sarna :* blackish purple.

L. Brownii : magnificent flowers, very large, white inside, purplish outside. Stamens chocolate.

L. Candidum maculatum fl. : white, striped and splashed purple.

L. Candidum : the common white lily.

L. Candidum fol. var. : green foliage, striped golden.

L. Krameri : large flowers, blush rose.

L. Harrisii : the Bermuda Lily, one of the best white flowering species.

L. Longiflorum philippense : the longest and narrowest white flowering Lily.

L. Washingtonianum : white, striped lilac.

The Martagon Lilies : with flowers distinctly recurved when fully expanded, of many descriptions, are only suited to the hills, and are best for bedding out.

A grand group of Lilies are those called *Archelirion*, of which I mention the best below. They are the Kings of Lilies, and pre-eminent among them is the *Lilium Auratum* or Golden-rayed Lily of Japan, white, with golden ray and crimson spots, of which there are some varieties. *L. Rubro Vittatum :* white, with crimson rays and spots, even larger than Auratum, *L. Speciosum album*, much recurved petals, white. All the

Speciosum Lilies have much recurved petals. *L. Speciosum rubrum:* white, suffused and spotted crimson. *L. S. Corymbiflorum:* white, spotted crimson, flowers in large panicles. *L. S. Melpomene:* dark crimson, very fine. *L. S. Macranthum:* very large, and *L. S. Schrynmakersii:* both dark purple crimson. *L. Tigrinum:* rich orange red, black spots. *L. T. Fortuenii:* scarlet, and black spots.

Lilium Thomsonianum is found wild in Mussoorie in large numbers, and comes as a species between other Lilies and Frittelarias.

I may again remark that great care should be taken that the drainage is perfect in the cultivation of Lilies, or they can never be grown satisfactorily. *Lilium giganteum* is found wild in Mussoorie. It has noble heart-shaped foliage, and is an enormously big plant, 10 to 12 feet high, bearing many flowers of a white color. It does best in a bed in a shaded corner of the garden.

There are an immense number of Lilies to select from in seedsmen's catalogues generally, but I would advise purchasers to get them from dealers in Holland, where they grow them largely. Ant Roozen & Sons have a branch firm, Messrs. Mertens & Co., 3, Cross Lane, St. Mary at Hill, London, E. C. Bulbs should be packed for transit from England to India in moss, or a little mould, in boxes which are not air-tight, but full of holes.

Lilies give great satisfaction in the hills. In the plains they are difficult; at least the finest varieties are. No floral beauties can be more stately and handsome than the Lily when grown in perfection. I have cultivated Lilies with great success in the hills, and got them to flower to perfection, planting the bulbs in March, April and May. The only difficulty I have experienced was with earth-worms, and before putting by the bulbs I have found it a good thing to steep them in strong tobacco water, and also to do the same before planting them.

LILY OF THE VALLEY.

See *Convallaria Majalis.*

LIMNANTHES.

Nat. ord., Tropaeolaceæ.

Half-hardy annuals: low growing and spreading, 8 inches high, with pretty yellow flowers. *L. Douglasii:* yellow, streaked grey. Sow in the plains in October, and in the hills in April. Suitable for beds, edgings and rockeries. Very pretty.

LINARIA.—*(Toad flax. Annual.)*

Nat. ord., Scrophularinæ.

There are many varieties of Linaria, which are all showy annuals, and should be sown in the border where they are to remain, in October in the plains, and at the same time with other annuals in hill localities. Their small flowers are borne in spikes in great profusion, and in masses and ribbons are most effective, each plant of itself not being attractive, as both the flowers and plants are small.

L. Bipartita splendens: purple and white.

L. Purpurea: purple.

L. Triphylla: yellow and purple.

L. Macroura: crimson and yellow (very pretty).

The seed is very fine, mix it with sand and sow thinly. If sown too thick, thin out the plants to an inch apart.

LINDENIA.

Nat. ord., Rubiaceæ.

L. Rivalis.--Flowers white, with a red tube, in corymbs, small and few flowered. Leaves lanceolate, two to three inches long, in clusters toward the ends of the shoots. The plant is about three feet high. A light soil well manured suits it, and it should be grown in a grass conservatory. It is propagated by cuttings put down in the rains. This is a comparatively new ntroduction.

LINUM.—*(Flax. Annual.)*

Nat. ord., Linaceæ.

This is a genus of free-flowering annuals, which should be sown much in the same manner as Linaria, but the seed being larger does not require to be mixed with sand to distribute it evenly. Sow it in the open border where it is to remain, at the same time as other annuals, from October to November, and again from February to March. They are pretty and showy; indeed, it is doubtful if they are surpassed by any other annual, as they are free-flowering, as mentioned before, and remain in flower for a long time.

Firminger says they should be transplanted cautiously; but I doubt if this is in any way beneficial to them. I rather think it injurious, as their after-growth is much retarded, and their flowers fewer, though not smaller, and by no means increased in size.

L Grandiflorum coccineum : crimson.

L. Flavum : golden-yellow.

L. Corymbiflorum luteum : straw-colored.

L. Grandiflorum : blue.

L. Kermesium : crimson.

L. Album : white.

They require a deeply dug rich soil, rather light. Though they may be sown in pots, they do much better in the border.

LINUM.—*(Flax. Perennial plant, now called Reinwardtia)*

Nat. ord., Linaceæ.

L. Trigynum, *L. Tetragynum*, and several other varieties.—These are most ornamental plants, which grow in the open border, and are propagated by division. The first-named has orange yellow flowers in the cold season, and the second variety is equally showy, with pale yellow flowers.

These plants grow to about two and a half feet in height, and flower in great profusion.

L. Alpinum : blue.

L. Arboreum : yellow.

L. Flavum : yellow.

L. Grandiflorum : rose.

L. Macraei : orange.

LISIANTHUS RUSSELLIANUS—*(For the hills.)*

Nat. ord., Gentianaceæ.

Sow this in October to be kept over till next year, when it will flower beautifully. It is a lovely plant bearing rich purple flowers, trumpet-shaped, borne in great profusion. Drummond, who discovered the plant, says of it: "not excelled in beauty by any other plant." These plants are rather difficult to cultivate. They are not much known in India, and require much attention. *Syn. Eustoma Russellianus. L. Pulcher* is a pretty variety, with scarlet flowers.

LIVISTONA.—*(A Palm tree.)*

Nat. ord., Palmaceæ.

L. Mauritiana.—This is a most handsome palm when young and grown in a pot. *L. Australis* has dark green leaves, much plaited, and divided at the edges. *L. Chinensis :* leaves large, fan-shaped, with pendant marginal segments. *L. Hoogendorpii :* very pretty leaves, a rich green, quite circular, much divided. *L. Rotundifolia :* another most handsome species, with circular rather erect leaves *(palmato multafid).*

LOASA.—*(Creeper. Annual.)*

Nat. ord., Loasaceæ.

L. Aurantiaca and *L. Nitida* have handsome flowers, the first-named having orange flowers, and the other yellow and red flowers. Their leaves sting like nettles when touched.

Sow in large pots or in the open border at the same time as other annuals, and when they require support, supply them with sticks or a small bamboo trellis-work.

LOBELIA.

Nat. ord., Lobeliaceæ.

I will not enlarge on this subject, as the cultivation of this most lovely, gemlike and exquisite of annuals is exactly the same as that of the Clintonia. (*See* CLINTONIA.)

Picotee : white, edged bright blue.

Erinus compacta aurea goldelse : golden foliage, bright blue flowers.

Swanley Blue : Strong growing, intense blue flowers.

Brighton : very dwarf, bright blue flowers.

Perennials and Perpetual :—

Barnard perpetual : ultramarine blue and white.

Beauty of Darmstadt : very dark, both in foliage and flower.

Cardinalis : intense red flowers.

Cardinalis mulberry : claret.

Fulgens : Scarlet.

Fulgens Victoria : rich scarlet, very floriferous.

Water the pots from below, as the plants are small and are sure to be destroyed if watered from the surface. Pinch off the shoots to make the plants branch and grow bushy. The perennial varieties of Lobelia are particularly handsome; these can be propagated from seed or cuttings.

LONICERA.—*(Honeysuckle. Creeper.)*

Nat. ord., Caprifoliaceæ.

L. Japonica, or Japan Honeysuckle, syn. *L. Chinensis*, is a shrub of some extent, requiring support, and with oval leaves of a whitish green, about two inches long. It is

common, and found in most gardens in India. Bears light yellow fragrant flowers. Propagated by layerings. It grows in any ordinary garden soil, and requires no particular attention, except to be trimmed when it grows beyond bounds. *L. Caprifolium* will only do in the hills; flowers yellow, with bluish tube.

L. Brachypoda, *L. Flexuosa aurea reticulata*, *L. Quinquelocularis*, are all to be found growing in our Indian gardens.

LOPEZIA.—*(Annual.)*

Nat. ord., Onagraceæ.

The seeds of Lopezia should be sown at the same time as other annuals. These are nice annuals, bearing flowers of a rose color, much like Clarkia, and requiring exactly the same treatment. *(See* CLARKIA.)

LOPOSPERMUM SCANDENS.—*(Perennial. Creeper.)*

Nat. ord., Scrophularineæ.

This is a creeper of not very extensive growth. Its leaves are soft to the touch, and have a velvety appearance, the lower side being of a lighter green, of whitish appearance. The seed should be sown in October both in hill-stations and the plains, and two or three plants placed in large pots. The flowers are large and of the shape of those of the Foxglove, of a pretty rose color. The plants not unfrequently come into flower the first season after they have been raised from seed, but if they do not, they are certain to flower the second season. The soil in which they are grown should be light and rich. The seed is small and imported seed generally comes up easily.

LOTUS.—*(Perennial. For beds, rock works, or dry banks.)*

(Bird's-foot trefoil—Lotus Jacobæus, etc.)

Nat. ord., Leguminosæ.

There are many varieties of Lotus which belong to the natural order *Leguminosæ*:—(1) *L. Corniculatus multiflorus*,

is a trailing plant, suitable to hanging baskets; (2) *L. Australis*, has beautiful rose-colored flowers in pretty spikes, and is of dwarf habit; (3) *L. Jacobœus luteus*, has yellow flowers; and (4) *L. Jacobœus*, has brown chocolate-colored flowers. All these grow to about two feet in height, and are very pretty, studded with innumerable small flowers. Nos. 2, 3 and 4 should be sown in pots and then planted out in the open; they are most striking plants with ternate leaves; leaflets narrow, small, and linear, of a delicate light green. They may be propagated by cuttings also, but it is better and easier to propagate from seed. They remain in flower almost all the year round, but bear their flowers in greater profusion during the cold season. They are in their perfection in the second year of their growth. Sow the seeds of Lotus in September or October both in the plains and in hill-stations; they may also be sown in February and March, though it is better to sow in September and October in the plains. *L. Sericeus* is another variety with flesh-colored flowers.

LUPINUS.—*(Lupin. Annual and Perennial.)*

Nat. ord., Leguminosæ.

There are many varieties of Lupins. In the plains their seed should be sown not earlier than October (except in the North-West Provinces, where they should be sown in August), and in hill-stations not till spring in the border or wherever they are to remain, for they will not stand transplanting well. It is as well to keep seed from plants grown in this country, as imported seeds sometimes fail. The tops of the plants should be pinched off for this purpose when the lower pods have grown to their full size, and the plants should be shaded from the sun. If this is not done, the seeds will not mature, but shrivel up. Plant two or three seeds in a spot. A light rich soil suits them best.

The following are considered the best varieties:—

L. Hartwegii and its varieties.

L. Hybridus and its varieties.

L. Menziesii, L. Magnificus, L. Pubescens elegans, L. Subcarnosus, L. Affinus: dark blue.

L. Alba coccinea: white and rose.

L. Hirstus: large blue.

L. Albus: white.

L. Horsutissimus: dark red.

L. Luteus: sweet-scented, yellow.

L. Mutabilis roseus: a rich rose color. Height five feet; perennial.

L. Subcarnosus: blue and rosy white; perennial.

LYCHNIS.—*(For the hills.)*

Nat. ord., Caryophyllaceæ.

L. Alpina, L. Chalcedonica, L. Grandiflora should be sown in the hills in October, in a light rich soil, and kept over the winter, to flower in spring and summer. The latter has larger flowers of brick red and vermilion color. Propagated by seed or by division.

LYCOPODIUM.—*(Perennial Ornamental foliage plant.)*

(Club Mosses.)

Nat. ord., Cryptogamia Lycopodiaæ.

These are fern-like plants of great beauty, trailing over a considerable extent of ground, and when in a healthy condition have a bright metallic lustre about them, which makes them most attractive objects. They are easily propagated from cuttings in sand during the rainy season, and are best planted afterwards in brick rubbish in a shady situation, either in pots or under a tree (when it affords them sufficient shelter). In the decoration of rockeries in the grass-house they are most useful. *L. Dendroideum, L. Phlegmaria, L. Taxifolium* are good varieties to cultivate.

LYCORIS.—*(Bulbous plant.)*

Nat. ord., Amaryllideæ.

L. Aurea bears golden yellow flowers, and *L. Radians* bears crimson flowers in August, of lily-like form. Propagated by division. Cultivation the same as Amaryllis. *L. Sewerzowi:* flowers brownish red, fragrant.

LYTHRUM.—*(Shrub.)*

Nat. ord., Lytharaceæ.

These are plants of upright growth and easy culture. They bear handsome flowers in dense long spikes at the summit of the stems, which grow to about three feet or more. The seed may be sown from September to November, and again in February and March, in the open beds or in pots, and transplanted to beds when strong enough to handle.

L. Alatum: pretty purple.

L. Graefferi: bright pink.

L. Roseum and *L. Salicaria:* the common purple species.

MACKAYA.

Nat. ord., Acanthaceæ.

M. Bella is a lovely plant. In England it requires special treatment to make it flower. In this country it flowers in grass conservatories fairly well in a gravelly soil mixed with leaf-mould and sand.

Its flowers are from four to six inches long, pale lilac, the throat pencilled with darker lilac markings, and produced in racemes of many flowers. Leaves ovate oblong, sinuately toothed; height six feet. In the summer growth should be encouraged. In winter rest is necessary. Propagated by cuttings taken during the rains.

MACROZAMIA.

Nat. ord., Cycadaceæ.

The leaves and trunk of these plants are like Cycas, but that the pinnæ have no mid-rib and are striate with

parallel veins. *M. Mackenzie* and *M. Plumosa* are probably the best. *M. Denisonii*, *M. Cylindrica*. *M. Fraseri* is a fine species; also *M. Petrowskiana*, which probably have not been introduced.

MAESA.

Nat. ord., Myrsineæ.

M. Racementosa or *Indica:* Tree of large size, which bears flowers in large racemes in profusion, white, in February. When in flower very handsome, but too large for most gardens.

MAGNOLIA.—*(A small tree.)*

Nat. ord., Magnoliaceæ.

**Magnolia grandiflora.*—This is a handsome tree of about 15 feet in height, with pretty, glossy, laurel-like leaves, and yields splendid large white flowers, which are sweet-scented. In Bengal it lives only with difficulty, and grows only to the size of a shrub. It is commonly propagated by layering or goothee, but with difficulty. In the North-West Provinces at Rajpur, just below Mussoorie, there is a fine tree 25 feet high, and I have seen some very fine plants of it in Mr. C. Nickel's garden in Mussoorie, who has many species of Magnolia growing well.

**M. Fuscata* is a small shrub, two or three feet high, a native of China, with exceedingly neat foliage, somewhat resembling that of a Camellia; bears in March small pale yellow or cream-colored fine fragrant flowers. It grows to a much larger size in its native climate, or in such a climate as suits it in this country, such as Rajpur or Dehra Dun in the North-West Provinces.

**M. Pterocarpa* is a large tree commonly seen in native gardens; has large white flowers which are very fragrant. It is a native of India.

**M. Anonœfolia.*

M. Acuminata.

*M. Auriculata. M. Obovata.**

M. Cordata.

M. Campbelli, with white flowers of large size, of which there is another variety in all respects the same, but with purplish pink flowers, of great beauty in the Darjeeling hills, as well as *Campbelli*, an exceedingly handsome tree.

**M. Conspicua.*

M. Sonlangeana, also *M. C. Nigre.*

M. Glauca.

M. Macrophylla.

**M. Pumila.*

M. Purpurea. M. Sphenocarpa.

M. Umbrella or *Tripetala. M. Stellata.*

**M. Mutabilis.*

I believe only those marked with asterisks (*) are cultivated in this country. They are all plants of great beauty, but require space, several of them growing in localities that suit them to large trees.

MALCOMIA MARATIMA.—*(Virginian Stock. Annual.)*

Nat. ord., Cruciferæ.

These are pretty sown in beds or ribbons, where they are to remain, in September to November in the plains, and in spring in hill-stations. *E. Maritima*, red; *M. Alba*, white. They are of easy culture, and may be sown in any garden soil enriched with manure, when they will grow to about half a foot in height.

MALOPE.—*(Annual.)*

Nat. ord., Malvaceæ.

Hardy annuals, of easy culture, which grow to the height of from one-and-a-half to two feet, free blooming, with cup-shaped or bell-formed flowers, which are very pretty. They may be sown at once where they are to remain, or pricked

out and planted when sufficiently strong. Sow in October in the plains, and in hill-stations during spring.

M. Trifida: purple; 1½ feet in height.

M. Grandiflora: crimson; 2 feet in height.

M. Alba: white; 2 feet in height.

MALPIGHIA.—*(Barbadoes Cherry. Shrub.)*

Nat. ord., Malpighiaceæ.

M. Coccifera is a handsome shrub, with leaves which Firminger compares to that of a Holly, which it is not by any means unlike. It bears whitish pink flowers, which are followed by a crop of berries much like small cherries, the size of a pea. The buds are white before they open. *M. Glabra* has glossy green leaves of an oval form, and pointed. Its flowers are purple, with yellow anthers in the centre. This is rather an agreeable looking plant.

M. Urens: Cowhage or cow itch cherry, white flowered, very pretty. *M. Punicifolia:* rose-colored flowers.

MALVAVISCUS.—*(Syn. Achania.)*

Nat. ord., Malvaceæ.

This is not by any means an ornamental shrub. Leaves three-lobed, acuminated, and roughish. Flowers crimson scarlet. Fruit first white, then turning scarlet. Propagated from seed or by cutting put down in the rains.

M. Arborens: flowers scarlet. Leaves cordate, three to five-lobed, rough. *M. Mollis:* soft-leaved, flowers scarlet.

MAMILLARIA.—*(Nipple Cactus. Pot-plant.)*

Nat. ord., Cactaceæ.

These are plants so called from their resemblance to the shape of the teats of animals. Most of them are pretty plants of a delicate appearance. They enjoy shade, and a light soil well drained. There are many varieties of this plant.

M. Bicolor bears small purple flowers. Stem club-shaped or cylindrical, eight inches high by three inches broad. *M. Clava* bears handsome flowers of a straw color at the summit of the plant. *M. Dolichocentra:* flowers pale rose. Tubercles protruding, covered with white down, and a few spines. *M. Gracellis:* flowers pale yellow, rather large. Plant small, only two or three inches. *M. Haageana:* flowers bright carmine rose, small. Stem bullet-shaped, when older slightly club-shaped. *M. Peacockii:* plant small and covered with down. *M. Pectinata:* flowers yellow, which only last an hour or two. *M. Pusilla:* flowers yellowish. Plant only one or two inches, covered with hoary bristles. A pretty plant. *M. Sanguinea:* flowers dark red, covered densely with hair-like spines. *M. Longimamma* and *M. Tenuis:* the former is of the shape of a finger, and the latter of a roundish form, with yellow flowers, most delicate in appearance.

MANDEVILLA.—*(Chilli Jasmine.) (Syn. Amblyanthera.)*

Nat. ord., Apocynaceæ.

M. Suaveolens.—Flowers pure white, very fragrant, borne in great profusion. Leaves cordate, opposite, oblong, dark green. The stems should not be shortened, as the flowers are produced at their ends. Raised from seed or layerings. Very pretty and useful. This requires a trellis, as it is a climber.

MANETTIA CORDIFOLIA.—*(Creeper. Tuberous-rooted plant.)*

Nat. ord., Rubiaceæ.

M. Cordifolia.—This is a small creeper, which is tuberous-rooted and of slender growth, and requires a small bamboo trellis-work to support it. It bears scarlet flowers of tubular form succeeded by cylindrical seed pods during the cold season. Propagated by division of its roots. It is very ornamental for conservatory purposes, and requires a moderate amount of shelter. *M. Bicolor:* bright scarlet flowers, leaves opposite, lanceolate-pointed. *M. Coccinia:* flowers have a white tube

spotted red, throat closed by yellow hairs. Leaves glabrous, shining, ovate-acuminate

M. Micans: rich orange flowers, panicles many flowered, leafy. Leaves ovate-lanceolate, bright green.

MANTISIA.—*(Dancing girls.)*

Nat. ord., Scitamineæ.

It is known by the above name, but its name is properly derived from Mantis, an insect, to which the flowers have been likened. *M. Salatoria* (dancing or opera girls). The flower petals are large, yellow, the remainder of the flower being purple, and altogether the flowers are of a peculiar shape. Bracts large, petal-like. Leaves broadly lanceolate, very elongated at the point, and petioles sheathing the stem entirely. The compost they should be grown in should be sand, charcoal, loam and leaf-mould, and it must be well drained, which is very necessary to the health of the plant, which is bulbous

MARANTA.—*(Ornamental foliage.)*

Nat. ord., Scitamineæ.

This plant is named after Maranti, a Venetian physician and botanist. The species *M. Arundinacea* being the plant that yields Arrowroot, as also *M. Ramosissima.* Those varieties grown in our gardens for the sake of their foliage are really lovely plants, with bright lustrous leaves with subdued yet rich colors intermixed, several having bars and stripes, others having crescents on the side of the midrib.

They vary in height and style of growth very much: some attain a stature of 4 feet, while others are not more than 4 inches high, with a bushy, dwarf, erect habit.

They are increased by division of the roots most easily at almost any season of the year, but the best time is about April, or a little before that, when they have just begun to

shoot after their season of rest. They should then be turned out of their pots, the roots washed clean, and then divided with a sharp knife into as many divisions as they have crowns; which should each be placed in a separate pan with a light porous soil well drained. At first they should be watered sparingly till they have started into growth.

It must be remembered, like all such plants that rest at a certain season of the year, they must at such time be very sparingly watered. Some of these plants die down altogether in the cold weather, while others are partially dormant. *M. Albo-lineata* syn. *Calathea ornata alba lineata.*

Maranta Asynometrica.—One of the newer varieties, very distinct leaves, dark green, marked with silver grey bands in numbers in an oblique direction. The midrib is peculiar, the blade being bulged out about an inch-and-a-half wide; form of leaf blades ovate.

M. Bicolor.—Leaves orbicular, pale green, and irregularly marked with olive green in blotches.

M. Bella.—Leaves pale green and grey markings alternately, running from midrib to margin, veined all over with faint markings of darker green.

M. Concinna.—Leaves obliquely ovate, blotched deep green near principal veins.

M. Kerchovei.—Ground color of leaves pale green, blotched in sets of pairs of brown marking on each side of the midrib, along the whole length of the leaf. Form of leaf small and blunted.

M. Nitens.—Leaves bright shining green, marked with oblong acute bars alternately of dark and pale green on both sides of the midrib.

M. Sagoriana.—Leaves oblong, pale green, on each side of midrib oblong oblique bars of deep green.

M. Smaragdina.—Leaves emerald green, centre marked deep green.

M. Porteana.—Leaves oblong acuminate, bright green, marked with transverse bars of white. Under-surface rich purple.

M. Verginialis.—Leaves deep shining green, with midrib white; the white and green being almost equally divided. Of dwarf habit.

TALL VARIETIES.

M. Alba Lineata.—Leaf stalks erect, bearing a leaf blade of bright green striped white (sometimes the leaves are entirely white): a most ornamental variety.

M. Leopardiana.—Leaf yellowish-green, blotched on each side of the midrib with green of a darker hue.

M. Zebrina.—Leaves with a light green midrib and bands of velvety black and light green alternately from costa to margin.

Many more may be mentioned of a most ornamental character: *Alba Vittata, Buchiana, Binotii, Chimboransis, Illustris, Medio-picta, Oppenheimiana, Ornata, Peunato Picla, Prasina, Regalis, Roseo Picta, Rubra, Sanguinea, Setosa, Splendida, Vertchii, Wallisii, Warscewiczii, Wiotii.* In all, one nursery in Calcutta names over 50 varieties.

MARTINEZIA.

Nat. ord, Palmæ.

M. Granatensis, M. Erosa and *M. Caryotaefolia* are about the best. They are armed all over the stems, leaf stalks, and, in some cases, on the leaves, with long spines. They are very handsome grown in a grass conservatory. *M. Erosa* is armed all over the leaves with spines.

MARTYNIA.—*(Shrub.)*

Nat. ord., Pedalineæ.

These are plants with coarse-looking foliage and rather handsome flowers, like that of a Foxglove in shape, and of

a rose color. The seed pods are hard and black, with two sharp thorns at the narrow end. It is best to sow them whole.

M. Diandra: rose-colored, of large growth.

M. Lutea: yellow flowers.

M. Fragrans: rose-colored, of smaller growth.

The flowers of this plant have an agreeable scent. They require to be protected from frost.

MASSANGEA.

Nat. ord., Bromeliaceæ.

These should be cultivated in the same way as *Billbergias*, which see *M. Hieroglyphica*, leaves dark green, banded black, handsome.

M. Lindeni: leaves marked with transverse bars of violet-brown.

M. Musaica: flowers with scarlet bracts, corolla white, calyx brown, ivory white at the apex. Leaves yellowish green, marked with patches of dark green.

These plants are now included by Dr. Hooker under *Caraguata*.

MATHIOLA.—(*Ten-week Stock. Annual and Biennial. Sweet-scented flowers.*)

Nat. ord., Cruciferæ.

Under this head I treat of the most desirable varieties of *Ten-week Stock* and *Emperor Stock*. They are exquisitely pretty annuals; but in Lower Bengal, though they thrive vigorously, they do not flower well. Some gardeners recommend their being sown in pots and allowed to get pot-bound, after which they transplant them; while others recommend sowing them where they are to remain, and consider that they receive too great a check by being transplanted. In the North-West Provinces and in hill-stations these annuals do well. They comprise nearly every shade of color extant, and the plants remain in flower for from a month-and-a-half

to two months, with flowers deliciously fragrant. In beds or masses, or ribbons, they are exquisitely pretty, and may be propagated by seed or cuttings. The *Ten week Stocks* usually bloom ten to twelve weeks after sowing, and grow from six to fifteen inches in height. If cultivated in a rich soil well drained, and watered occasionally with liquid manure, not flooded, as is often done in the North-West Provinces, much to their detriment, but simply hand-watered, they will throw out a number of laterals, each plant forming quite a bouquet, indeed difficult to surpass in grand effect: quite a floral gem. *Emperor Stocks* are sometimes called *Perpetual Stocks:* they are half-hardy biennials, hybrids of the *Brompton Stock*, and they grow to about eighteen inches high, and in hill districts should be sown early in October and again in March and April, making autumnal bloomers, and flower on to Christmas. Sown in June, they will flower during the same month the following year.

The *Brompton* and *Giant Cape* are called *Winter Stocks* on account of their not flowering the first year. The *Brompton Stock* is branching, and the *Giant Cape* grows to an immense pyramid; both are considered half-hardy biennials. The *Intermediate Stock* is dwarf and branching, is also a half-hardy biennial, is largely grown in England, and flowers during the early summer month. In the plains, Stocks should be sown in August and September, *if acclimatized seed is sown*, and in October or November, if the seed sown is imported. The really double Stock and double wall flower do not produce much seed, if any, but I mention below the method adopted by Ratagan *to obtain double seeds:* "I have for several years confined myself to obtaining seed from a *single flowering Stock surrounded by others of the non-seeding kind*, merely taking the precaution to remove all flowers that may have appeared on the single plant before its contact with the double flowers, and gathering only a few pods from each branch of the Stock." His experiments were successful, as proved by various

correspondents. It has also been recommended by others that all plants with long tap-roots should be rejected, as they will produce single flowers, and reserve those which have the greatest quantity of delicate fibres at the roots. This cannot be ascertained unless the plants are transplanted. Experience shows that these will produce double flowers.

Propagation by cuttings.—This is only resorted to when any kind is seen which it is considered desirable to propagate; *otherwise propagation by seed is far preferable.* In taking cuttings, the side shoots should be stripped off with a portion of the heel, or they may be cut off very close to the plant and placed in a very light soil, or in sand under a hand glass. They should be taken off as soon as they are large enough to handle; and if they begin to bloom before they are sufficiently large, which will sometimes happen, the bloom must be pinched off as soon as it appears. Peat and loam are the stuffs used for compost in England to grow the Stock in. If peat cannot be obtained, *leaf-mould and fibrous turf, mixed with a very small quantity of charcoal and sand,* will suit the purpose. To those who love to make experiments in gardening this is a plant that will give them ample scope, by procuring seeds that will give double flowers :—

Dwarf German Ten-weeks' Stock : colors various.

New Miniature Stock : colors various.

Large-flowered Ten-week German Stock : colors various (very fine).

New Large-flowered Pyramid German Ten-week : colors various.

Giant Ten-week Stock : colors various.

The new Large-flowering Emperor (perpetual): colors various.

Emperor (perpetual) : colors various (very fine).

Brompton Stock (perpetual) : colors various.

Giant Cape Stock (perpetual): colors various (very fine).

Intermediate Stock (perpetual): colors various (very fine).

Novelty—Stock Mammoth, white column, is a fine variety; very handsome, of great size. (Himalayan Seed Stores, Mussoorie.

MAURANDYA BARCLAYANA.—*(Creeper. Perennial.)*

Nat. ord., Scrophularineæ.

This is a very delicate-looking slender creeper, with small pretty leaves of a refreshing green, and small snapdragon-like flowers of different colors—white, lilac, violet, blue and rose-colored. It has rather woolly leaves. It is necessary to supply it with bamboo trellis-work. It grows in almost any soil, and may be sown at almost any season of the year, but the best time is from September to October and February to March. It is a small plant, and can be grown in perfection in pots or boxes, as well as in the open, where it re-sows itself abundantly. It lives for years if trimmed of decaying foliage and protected from frost. It flowers throughout the year.

MELALEUCA CAJEPUTI.—*(Cajeput Oil tree.)*

Nat ord., Myrtaceæ.

This is a tree remarkably like a willow, both in foliage and in its graceful habit. Its branches droop with its foliage, which is of a greyish-green color, and when bruised emit the odour so agreeable and peculiar to Cajeput oil. This tree bears seeds, which, when sown by the hand, seldom germinate, but self-sown plants come up round the trees. I have sown the seed of this tree, but failed on two occasions The trees grow from fifteen to twenty feet in height.

MELOCACTUS.—*(Turk's Cap or Melon Cactus.)*

Nat. ord., Cactaceæ.

These cacti are so called from being shaped like a melon. Propagated by division. Grown in well-drained pots in rich

light soil. They are more curious than pretty. They are much like each other, and there are about thirty species

MELASTOMA.—*(Shrub.)*

Nat. ord., Melastomaceæ.

M. Malabathrica: a small shrub with purple flowers and elliptic-oblong leaves, acute at the apex, not very attractive, and delicate. *M. Sanguineum:* much the same as the former, but leaves ovate-lanceolate.

MELIA.—*(Tree.)*

Nat. ord., Meliaceæ.

M. Sempervirens: flowers bluish. Leaves bipinnate, deeply toothed. Rather a handsome tree when in flower. Propagated by seed during the rains.

MELODINUS.—*(Climber.)*

Nat. ord., Apocynaceæ.

M. Monogynus: flowers white, fragrant, in axillary and terminal panicles, crowded. A rather large climber. Leaves lanceolate, shining. It bears fruit the size of an apple. Propagated by seed and cuttings put down in the rains.

MEMECYLON.

Nat. ord., Melastomaceæ.

M. Tinctorium: a small tree, very pretty with its glossy leaves, and when in flower with its lilac flowers which are fragrant. A jungle plant of this country. *M. Capitellatum* has smaller leaves, but in other respects is the same.

MESEMBRYANTHEMUM.—*(Fig marigold and Ice Plant.)*

(Annual, half-hardy.)

Nat. ord., Ficoideæ.

Mesembryanthemum is so called from *sembria* midday, and *anthemos* a flower, and very aptly so, for its blossoms open

when the sun shines on them most powerfully. It is a native of the Cape of Good Hope; profusely flowering and extremely pretty; effective in edgings, rock work, rustic baskets and vases in a sunny situation. The seed should be sown in September and October in the plains, and in March or April in the hills, with a little bottom heat, and the pots should be kept well moistened (watered from below by saucers of water) till the seed germinates.

M. Glabrum: yellow; ¼ foot high.

M. Tricolor: various—pink, purple, yellow and white; ¼ foot high.

M. Album: white with purple or crimson centre; ¼ foot high. They have cineraria-like flowers which sparkle in the sun's rays.

The soil it is grown in should be light and well-drained. The Ice plant belongs to the *Fig marigold* tribe, but it is only pretty for its foliage; its flowers are quite insignificant. The plants occupy a space of a foot square if well grown; and are used as decorations in-doors and in the conservatory. Sow the seed of *M. Crystallinum* at the same time as the other varieties in pots, and when strong enough, transplant them singly. *M. Cordifolium* is a perennial species. It bears bright purple flowers which open only in the sun, and are about the size of a four-anna bit. Propagated by seed in October in the plains and April in the hills.

MESUA FERREA.—*(Iron wood tree.)*

Nat. ord., Guttiferæ.

The iron wood tree or *Nâgsura*, or *Magesur* of the natives, is a jungle tree of great beauty. I have met them growing in the Chittagong forests, but many have been cut away. Flowers white, about the size of a sweet briar, and very sweet-scented. The leaves are elliptic-lanceolate, acute, and glaucous beneath. The stamens of the flowers are yellow, and contrast beautifully with the white petals. The wood is prized

for its extreme hardness. White ants make no impression on it, and it is therefore used largely for posts of houses, which has led to its being extensively cut down in the forests. Rather slow growing, but very handsome and desirable.

MEYENIA.—*(Shrubs.)*

Nat. ord., Acanthaceæ.

Meyenia Erecta.—A pretty shrub, with pretty gloxinia-like flowers, bluish purple with a pale yellow tube. The leaves are glossy and oval, myrtle-like, but larger. Propagated by cuttings and seed. It grows in any ordinary garden if well manured and watered during the hotter months of the year. It flowers chiefly in the cold season. *M. Hawtayneana:* a climber with slender stems, heart-shaped leaves, and azure-blue flowers, rather large, with a white tube. Nearly always in flower. Propagated by seed.

MICHELIA.

Nat. ord., Magnoliaceæ.

M. Champaca, or "*Chumpa*" of the natives, will grow to 25 or 30 feet or more, is common in native gardens, and is closely allied to Magnolia. It bears yellowish flowers of a dull color, which are very fragrant. Leaves obvate-oblong acuminated, ribs rather silky beneath, as well as the peduncles.

Propagated by seed sown at almost any time.

M. Lanuginosa: flowers pale yellow. *M. Alba:* flowers white.

MICROMELUM.

Nat. ord., Aurantiaceæ.

M. Integerrimum.—A shrub described by Firminger as bearing small greenish white flowers, which are exceedingly fragrant, and afterwards bunches of berries, which, when bruised, emit a powerful fragrance. Propagated by cuttings put down in October. I do not know this plant.

MILLINGTONIA HORTENSIS.—*(Tree.)*

Nat. ord., Bignoniaceæ.

A common tree in India. Flowers white, in long tubes in large panicles. Too large for gardens, but good for avenues. Very pretty, when in flower especially.

MIMOSA PUDICA, &c.—*(The humble plant and the sensitive plant.)*

Nat. ord., Leguminosæ.

M. Pudica (the humble plant).—A plant with pinnate foliage. A prostrate plant with sensitive leaves and slender habit, at all times in blossom, and bears abundance of seed, from which it may be propagated.

M. Sensitiva.—This is the true sensitive plant, though its foliage is not so sensitive as *M. Pudica*, which grows wild in many parts of India. *M. Brevipenna:* a plant with ornamental foliage of a most delicate pinnate character, with minute leaflets. Cut the plants to make them grow bushy.

MIMULUS.—*(The Monkey flower. Annuals, for pots.)*

Nat. ord., Scrophularineæ.

A genus of extremely handsome plants, which flower profusely the whole season. The soil they are sown in, and are afterwards transplanted to grow in, should be nearly half sand and half leaf-mould and loam. The pots, or what is better shallow pans, must be well-drained, and when the seed is sown in September and October, must be watered from below *(not from above)*; when they are strong enough, transplant them, a few in each pot, or in hanging baskets, etc.; or if the pots are small, one plant in each pot. In hill-stations, seeds sown in spring will make good bedding plants for summer blooming; and seeds sown in autumn produce effective early flowering plants for green-house or

conservatory culture. Below are some of the most favorite varieties :—

M. Cardinalis : scarlet.

M. Cardinalis atrosanguineus maculatus : dark red.

M. Cardinalis Lehmannii : bright rose.

M. Cardinalis Napoleon III : rich purple.

M. Roezlii : yellow, dotted red.

M. Repens : trailing purple and yellow.

M. Cupreus hybridus : spotted varieties, superb and large.

M. Neuberti : a charming variety.

M. Cardinalis grandiflorus : many colors, large flowers.

Novelties—M. Beauty of Sutton is a great improvement in this flower. It is double and very large, with more substance, therefore lasting much longer.

M. Pencombe Rectory, also very fine double.

New single *Mimulus, Magnum Bonum, Mabel Clara, Golden Pheasant.*

The above may be propagated from cuttings placed in water or in sand, or in sand and water together. The pots or pans they are grown in should be well watered. They grow to about one foot in height.

MINA LOBATA.

Nat. ord., Convolvulaceæ.

A lovely climber, which is sown as an annual in India, and flowers well the first year, though a perennial. Its foliage is like those of the genus to which it belongs, but the flowers are in sprays of quite a different form, like bells, when first opening crimson, then changing to yellow. Sow in October in the plains and in March in the hills.

MIRABILIS.—*(Marvel of Peru. A shrub.)*

Nat. ord., Nyctagineæ.

A plant quite acclimatized to this country, and grown easily from seed. A herbaceous plant called by the natives *Gool-ubâs;* the flowers are either yellow, red or white; or red and yellow, red and white, or yellow and white; or all three colors together. The seed may be sown at any time of the year, but the best time is between September and October and February and March. The seed is like a black pepper corn. The tall varieties take up some space, but there are some nice dwarf kinds which are compact in habit.

MONSTERA.—*(Araceæ.)*

Nat. ord., Aroideæ.

Curious ornamental leaved plants. The foliage of *M. Deliciosa* is much punctured and divided, leathery. A handsome plant. The flowers are white, succeeded by a succulent fruit with a luscious pine-apple flavour.

M. Adamsonia.—Flowers yellow, white; spathe boat-shaped. Leaves ovate-cordate.

The above plant should be planted in a rich soil, and if allowed to stand against a damp wall will adhere to it by its aërial roots. Should be grown in a grass conservatory in the plains, and in a glass conservatory in the hills.

MONTBRETIA.

Nat. ord., Irideæ.

Lovely little bulbous plants, with gladiolus-like foliage, bearing flowers in spikes of very rich colors. They do well in the plains or hills. *M. Cocosmæflora* and *M. Potsii* are those best known, the former bearing flowers scarlet and golden yellow, and the latter much like it, but finer. *M. Crocosmiæflora flore-pleno*, with foliage stronger and more robust, is a new variety, with double, deep orange flowers, very fine.

Golden Sheaf: golden yellow, very floriferous. *Transcendant* bears large flowers, orange vermilion, yellow throat. Plant the bulbs in the hills as soon as received. In the plains plant them in October. They are best left undisturbed in the ground for two or three years, and then form fine large clumps.

MUNRONIA.—*(Shrub.)*

Nat. ord., Meliaceæ.

M. Javanicum.—A plant Firminger states as having been introduced by Mr. Grote Flowers produced during the rains, white, very fragrant.

Propagated by cuttings put down in the rains.

MURRAYA.—*(China box. A shrub.)*

Nat. ord., Aurantiaceæ.

M. Exotica.—This is a common shrub with thick glossy leaves, pinnate; each leaflet obovate. Bears white flowers, which are sweet scented and in corymbs, succeeded by red berries. Propagated by cuttings. *M. Sumatrana* is much like the above, but has larger leaves.

MUSA.

See *Heliconia.*

MUSCARIA.—*(The Grape Hyacinth.)*

See *Hyacinth.*

MUSSAENDA.—*(Shrubs and herbs.)*

Nat. ord., Rubiaceæ.

They are peculiar in producing out of some of the calyces of the flowers white leaves, which contrast is pretty. Leaves ovate, petiolate, villous or glabrous. Propagated by seed or by cuttings put down in the rains. *M. Frondosa:*

flowers orange scarlet. The largest flowered species; *M. Luteola:* yellow. *M. Corymbosa:* flowers bright orange scarlet. *M. Latifolia:* much like Luteola. *M. Uniflora:* flowers in the form of a long tube, sweet-scented, white. Suitable for basket culture. A vigorous and free flowering herb. Native of Cochin-China. Propagated by cuttings in the rains.

MYOPORUM.

Nat. ord., Myoporineæ.

A pretty shrub is *M. Conjestum*, bearing white flowers not uncommon in the Calcutta gardens, of erect growth. *M. Acuminatum* bears white flowers. *M. Debile:* pink or purple flowers. *M. Parvifolium:* white flowers and small crowded leaves. *M. Serratum:* white and purple. Their leaves are alternate, entire and toothed. The name given to them Myoporum refers to the transparent spots on their leaves. Propagated by cutting of the young shoot in the rains.

MYOSOTIS.—*(Forget-me-not. Perennial.)*

Nat. ord., Boragineæ.

The seeds of *Myosotis* should be sown in October and November, in pots; and being a semi-aquatic plant, must be well watered, but not from the surface, when sown; the pots must be placed in pans of water. Though they are perennial, *they must be treated as annuals in the plains*, as they will not outlive the hot months unless the greatest care is taken with them. In the hills sow in September or October and keep over winter to flower in spring.

M. Palustris (Forget-me-not): blue with golden eye.

M. Dissitiflora is one of the best flowers, about half an inch in diameter, turquoise blue, in long racemes.

M. Alpestus rosea: rose color.

M. Azorica: white and purple.

M. A. Alba : a mass of white flower.

M. Sylvatica : or clievedon blue ; bedding variety.

M. A. Cœlestina : turquoise blue.

Novelty—M. Stricta : flowers in a massive pillar, blue.

MYRISPHYLLUM.—*(Asparagoides.)*

Nat. ord., Liliaceæ.

Sometimes called *Medeola asparagoides*, a lovely little climber with beautiful spray-like branchlets used in the composition of wreaths and button holes, bouquets, etc. The little leaflets are heart-shaped and glossy. Its flowers are inconspicuous, but scented. It is a tuberous-rooted plant and perennial. Procurable by seed sown, or by division. It is best grown in partial shade.

MYROSPERMUM.

Nat. ord., Leguminosæ.

M. Frutescens.—A small tree, bearing whitish rose flowers. The leaves are pinnate and alternate, smooth.

MYRTUS.—*(The Myrtle. A shrub.)*

Nat. ord., Myrtaceæ.

M. Communis.—This plant is well-known to every one. It bears white flowers, succeeded by dark berries. Propagated by layering.

M. Tomentosa : a species with pink flowers.

NAEGELIA.

Nat. ord., Gesneriæ.

These are plants with lovely leaves and flowers. They do not do well in Bengal generally, where they have to be cultivated in a grass conservatory, and must be kept as cool as can be. They do better in the North-West Provinces. In hill-stations they are at home, and thrive with the same treatment as gloxinias. They are propagated by division

of the roots, by cuttings, and by leaves pegged down on sandy soil. *N. Zebrina* may be met with in the gardens in Calcutta, but few of the other species are to be met with. *N. Abomey*, large, whitish rose, spotted on the limb, which is white with rose; leaves brown, variegated. *N. Amabilis*, large, white. *N. Archimandrite*, soft lilac crimson, throat yellow, spotted crimson. *N. Behanzin*, rosy white, large, spotted carmine, throat yellow. *N. Clifton*, very large, flaked carmine, tube half golden half vermilion. *N. Columbine*, citron yellow. *N. Gabrielle*, carmine. *N. General Dodds*, rosy white limb, spotted rose. *N. Itambé*, deep vermilion round yellow blotch. *N. Kana*, large, claret, striped and spotted carmine. *N. Le Crepuscule*, golden yellow. *N. Prince de Bulgaire*, orange yellow, and many others.

NANDINA.

Nat. ord., Berberidaceæ.

N. Domestica.—The sacred Bambu of China, about 6 to 8 feet high. Grows in almost any soil. Has a fine feathery appearance.

NAPOLEONA.—*(Syn. Belvisia.)*

Nat. ord., Myrtaceæ.

A plant of Tropical Africa with Camellia-like foliage, leaves short-stalked, ovate-acuminate. This shrub, which grows to the height of 6 feet or more, was at first quite a botanist's puzzle, owing chiefly to a bad illustration given of it by the author of "Flore d'Oware et de Bénin," but which was cleared up when Whitfield, a botanical collector, brought it to England in 1843 from Sierra Leone. *N. Imperialis* bears very peculiar flowers, apricot and crimson, fading to a bluish tint, in some respects like a passion flower, and produced close to the stem of the bush. A handsome shrub, easily propagated by cuttings put down during the rains.

NARCISSUS.—*(Bulbous plant.)*

Nat. ord., Amaryllidaceæ.

These bulbs are grown in stiff rich deep soil; they thrive best up-country and in hill-stations; in Lower Bengal they will not do so well, and refuse to flower. The treatment for these bulbs is much the same as for the Hyacinth. They must be watered very slightly before they begin growing. The bulbs must be planted five inches underground when they are grown in beds, and less when they are grown in pots. Both in the hills of the North-West Provinces and in the plains they should be planted in September. Water them sparingly at first, or they are liable to run to leaf, and in such case do not flower, or flower poorly. They may also be planted in January or February, and in that case flower in spring. This applies to Jonquils also, and to Daffodils. In the locality above mentioned, which suits them, they are grown with ease if not watered too copiously at first. In the ground they may remain undisturbed for many years. If grown in pots they may be shaded when in flower, which makes their bloom last much longer, and the flowers are, I think, finer. The trumpet varieties are more difficult to deal with. The Chinese Sacred Lily is a Narcissus, and may be treated similarly; but when grown in water, their bulbs are exhausted and should be planted in soil the following year. When grown in an aquarium a little sand should be placed in the bottom of the vessel, and the bulbs jammed in between a few small pieces of rock to hold them in position.

The trumpet varieties flower best when planted in beds, and do not flower readily in pots. In winter it is best to cover the plants in beds with straw. The trumpet varieties grow in water better perhaps than the others. Narcissus are divided into groups—1st, The *Trumpet* and *Bulb acodium Narcissus;* 2nd, *Mediicoronatæ* or *Mock Narcissus (Queltia);* 3rd, *Parvicoronatæ* or *True Narcissus (Poeticus* and *Tazetta), (Polyanthus Narcissus).* The first have very long trumpets.

The second have shorter trumpets. The centres of the third division are merely crowns.

When grown in water, the water will require to be changed, and not allowed to grow stagnant. Grown in soil, as soon as the flower shoots appear, liquid manure may be employed with much advantage. In fact, I think it absolutely necessary. If the bulbs are taken up after flowering, this should not be done till the leaves are perfectly dry. Store the bulbs away in sand in a drawer or box.

NASTURTIUM.—*(Indian Cress. Annual. Small Shrub and Creeper. Tropæolum Lobbianum.)*

Nat. ord., Tropæolaceæ.

There are two varieties of Nasturtium, the dwarf or shrubby varieties, and the tall or climbing varieties, which require support. The dwarf sorts are considered among first class bedding plants. The scarlet, yellow, and spotted Tom Thumb are well known favorites, as also are the Old Crimson and Crystal Palace Gem. The seed will require to be sown in October and November in the plains, in Bengal, and in spring and in the rains in June in hill-stations. In the plains, in the North-West Provinces, and up-country generally, where there is any likelihood of frost, they must be sheltered from it, and may be sown again early in spring and in June, as well as in October and November. These plants class with Geraniums, Verbenas, and Calceolarias as bedding plants in Europe; their close and compact growth, the richness of the coloring of their flowers, and the freedom with which they bloom, combine to make them very popular. They may be sown in ribbons of different colors most effectively. The husk should be taken off the seeds *carefully* before sowing them, or they may be soaked in hot water *(not too hot, a little hotter than the hand can bear)*, and kept in it for two or three hours.

Each seed should be planted four inches apart in rather poor soil where they are to remain. In rich soil they produce

leaf to the detriment of their flowers, which are hidden by it.

In America some fine novelties have been produced which are worthy of note, namely, the *Tom Pouce*, trailing Nasturtium, splendid for baskets. The foliage and flower differ from all other Nasturtiums. The plants have no tendency to climb, and are two feet high. The leaves are leathery, dark green, and flowers much smaller, but borne in great profusion. Colors yellow with citron blotches, and orange with red blotches. *The Californian Tom Thumb Giant flowering Nasturtiums* measure about 3 inches across, and include a great variety of colors.

These may be procured from the Himalayan Seed Stores, Mussoorie, who have them for the first time in India.

The *Majus*, creeping or tall kinds, are exquisite, and may be grown up a trellis so as to form a screen, the seed being sown at five inches apart. All varieties of Nasturtium seed germinate most freely in this country, and do not degenerate in any degree by acclimatization. I would, therefore, recommend the seed being gathered yearly, as sometimes (though not often) imported seed does not germinate. The Nasturtium grows well in almost any soil, and is extremely hardy, but should be sown in poor soil, or the flowers will be hidden considerably by foliage. Water them well in hot weather and when they are in flower. The seed of a Nasturtium makes a good pickle while green, mixed with other vegetable, such as onions, beans, cauliflower, etc. The leaves and seed are pungent to the taste like Cress, and it is called by some Indian Cress, and used as an addition to salads. The tuberous-rooted and perennial varieties are dealt with under the head of *Tropæolum*.

NELUMBIUM.—*(Water bean.)*

Nat. ord., Nymphæaceæ.

N. Speciosum.—This is a common plant in the tanks and lakes of India, and bears pretty rose-colored flowers,

which are very large and double. It seeds abundantly, and may be sown by enclosing the seeds in balls of clay which should be thrown into the water. *N. Luteum* is a yellow flowering variety.

NEMESIA.—*(Annual.)*

Nat. ord., Scrophularinæ.

N. Suttoni is a nice little annual, the flowers it bears being of different colors and a great improvement on *N. Floribunda*, which is so much like Linaria as almost to be mistaken for it. The same treatment does for it as for Linaria. Sow where it has to remain in October in the plains, and in March or April in the hills.

Nemesia Versicolor, violet or pale rose.

NEMOPHILA.—*(Annual.)*

Nat. ord., Hydrophyllaceæ.

These are all exquisitely pretty dwarf annuals. They should never be sown before the cold weather has fairly set in. They will not bear transplanting well, and I would, therefore, recommend their being sown where they are to remain. All the varieties are neat, compact, and uniform in their habit of growth, and on this account they are useful, sown in ribbons, in circles, or otherwise, as the fancy may suggest. *N. Phacelioides* is a perennial variety. *N. Maculata* is most robust in its growth, and has larger flowers than the other varieties. They are all propagated from seed most readily.

N. Atomaria elegans: white centre, chocolate ground, margin of white.

N. Atomaria: white spotted.

N. Alba: white.

N. Celestris or *Insignis:* blue spotted.

N. Discoidalis: black, bordered white.

N. Striata: striped.

N. Maculata: white, blotched violet.

N. Oculata: blue, black centre.

N. Purpurea: white, broadly edged with purple.

N. Elegans: maroon black, white margin.

Sow the seeds of Nemophila in the plains in November, when the weather is fairly cold, and not before that, and in hill-stations at the same time as other annuals. They grow from four to six inches in height.

NEPENTHES.—*(Pitcher plant. Creeper.)*

Nat. ord., Nepenthaceæ.

Nepenthes are natives chiefly of Ceylon, the Straits, and China. There are many varieties of this plant, as beautiful as they are curious. *N. Distillatoria* is very graceful, with dark green pitchers. *N. Rofflesiana* has pitchers beautifully colored. *N. Phyllamphora* has bright green pitchers in great abundance.

Their leaves are curiously formed, with a tendril at the end bearing the pitcher, in some varieties colored most gorgeously. They thrive in a slightly shaded situation, grown in the compost mentioned below, and kept moist. The drainage must be most particularly looked to. They may be propagated by cuttings, layerings and seed. The flowers of all the varieties are insignificant: their beauty consists in their leaves and pitchers. They are creeping plants, and require the support of trellis-work.

The seed should be sown thinly in a soil made to resemble peat (loam, cocoanut fibre and very old leaf-mould) two parts, and moss, chopped fine, one part. The pan they are sown in should then be covered with a bell-glass, and be kept close for a month, when the plants will have appeared. *N. Madagascarensis* and *N. Northiana* are the largest species, bearing huge pitchers. Cuttings should be struck in the compost above mentioned and kept close till rooted. They require a close humid atmosphere.

NERINE.—*(Bulbous plant.) (Guernsey Lily.)*

Nat. ord., Amaryllidaceæ.

These are bulbous-rooted plants. The Guernsey Lily belongs to this class, and is called *Nerine Sarniensis.* In Lower Bengal they do not thrive well. The flower of this plant is really beautiful, brilliant scarlet, and looks when the sun shines on it as if it was spangled with gold-dust. The bulbs arrive in England from Guernsey in September, and should be ordered some time before that, as they are sent with their buds ready to expand. Orders should therefore be sent to the florist in England to procure bulbs in June and forward them immediately; and they may be planted in this country in August and September, or as soon as they start into growth, should that be earlier; though they should be retarded till the months before mentioned by keeping them dry in a cool and airy place. They do very well in the hills planted in a border, in well prepared soil made up of loam and leaf-mould, charcoal and sand. *N. Curirfolia,* scarlet. *N. Flexuosa,* crimson scarlet. *N. F. Excellens,* rosy pink. *N. F. Pulchella,* pink, striped red. *N. Sarnensis* or Guernsey Lily, pale salmon. *N. S. Corusca,* glittering, orange scarlet. *N. S. Venusta,* fiery scarlet, in large heads. *N. Undulata,* flesh color. Some of the species flower before sending out leaves. After the flowers have appeared they require no watering. Begin watering them again in September. In winter again withhold water till March in the hills.

NERIUM.—*(The Oleander or Rose Laurel. Shrub. Sweet-scented. Kunel.)*

Nat. ord., Apocyneæ.

These shrubs are most common and bear flowers at the end of their shoots, which grow to the height of seven or eight feet. Their leaves also are chiefly confined to the summit of these shoots or rods. They grow readily from layers and division, and the single varieties strike readily

from cuttings. Their flowers are white, rose-colored and dark red, both single and double. Some varieties have variegated flowers. They grow easily and without any particular care in any ordinary garden soil. They are very pretty when in full flower, especially the double varieties, which are loaded till drooping with clusters of flowers. *Odoratum*, pink, scented. *Odoratum Carneum*, flesh, scented. Double pink and white, scented. *O. Albumplenum*, double white. *Variegatum*, red, variegated foliage.

NICANDRA.

Nat. ord., Solanaceæ.

N. Physaloides.—Rather a coarse-looking large annual, growing from two to four feet high, with blue flowers, rather large, of cup form, with a white base, and five dark spots, one at the base of each petal. Sow in the plains in October, and in the hills in March or April.

NICOTIANA.—*(Tobacco.)*

Nat. ord., Solanaceæ.

Sow thinly in a seed bed and transplant in October in the plains. Their flowers are sweet-scented, and leaves ornamental in sub-tropical gardening.

N. Macrophylla: crimson flowers.

N. Affinis: very sweet-scented, white.

N. Fragrans: very sweet-scented, white.

N. Glauca: yellow.

NIDULARIUM.—*(Syn. Karatas.)*

Nat. ord., Bromeliaceæ.

Plants with leaves sometimes very long and recurved, pine-apple-like; sometimes nest-like, and bearing flowers in dense sessile terminal heads. These plants are grown in grass conservatories.

N. Huniclis: very long spiny leaves, flowers crimson.

N. Spectabilis: leaves 1 to 1¼ foot long by 1½ to 2 inches broad; flowers white, blood red, pale violet.

N. Fulgens: red.

NIEREMBERGIA.—*(Perennials: treated as annuals.)*
Nat. ord., Solanaceæ.

These are plants of trailing habit, and when grown in hanging baskets are very pretty. *N. Nigricans* bears dark crimson flowers. *N. Gracilis alba*, white flowers, which are white veined or pencilled with lilac or purple. They grow best in a light soil. Sow seeds of Nierembergia in October and November, when the cold weather has fairly set in. These flowers, though perennials, have to be treated as annuals only in the plains of this country. They flower in the first year of their growth.

NIGELLA.—*(Annual.) (Devil in the bush.)*
Nat. ord., Ranunculaceæ.

Leaves much cut in narrow pinnæ: of the easiest cultivation. Sow in October in the plains, and in March, April and May in the hills.

N. Damscena: white or blue.

N. Hispanica: blue.

N. Orientalis: yellow, spotted red.

NOLANA.—*(Annual. Trailing plant.)*
Nat. ord., Nolanaceæ.

Pretty trailing plants, with much of the habit of *Convolvulus Minor.* Sow the seeds in shallow pans, where they are to remain, as they do not stand transplanting well, in October and November in the plains, and with other annuals in hill-stations. They grow well in hanging baskets.

N. Paradoxa: blue.

N. Atriplicifolia: blue, white and yellow: large flowers.

N. Alba: white.

N. Prostrata: blue with white centres, marked with dark lines.

NYCTANTHES.—*(A small tree.)*

Nat. ord., Jasmineæ.

N. Arbor Tristis.—This tree grows to about ten feet in height, and is sometimes rather unsightly from its bare woody stem being visible: but this should not be the case if the soil is well manured and the trees renewed every three or four years. It is propagated from seed most readily. The flowers are star-like and white, with orange centres, and are used as a dye by the natives, by whom it is called "Hâr Singhar" or "Hâr Singhârâ." It flowers in great profusion, and the ground round the trees is regularly carpeted with fallen flowers daily, when they are picked up by the natives for dyeing purposes. The flowers are very fragrant. The trees are of rapid growth.

NYCTOCALOS.—*(Creeper.)*

Nat. ord., Bignoniaceæ.

Thomsoni.—Bears white flowers, which expand at night and drop in the morning. Corolla with a long tube seven inches or more. The leaves are trifoliate. I think they would be best grown in a grass conservatory.

NYMPHÆA —*(The Water Lily.)*

Nat. ord., Nymphæaceæ.

There is a large variety of these natives of tropical climates, of which I mention only a few. The British variety is generally classed under the name *Nuphar*, and is yellow. Egypt affords us a large number, which vary in colour—blue, pink, white and yellow. There are a good many also which are natives of Bengal.

N. Stellata: blue with yellow centres, and semi-double.

N. Sturtevantii : rosy red.

N. Rubra : brilliant red.

N. Odorata : white.

N. Versicolor : rose.

N. Stellata : blue.

N. Alba : a British variety, has very double white sweet-scented flowers.

The seeds of these are sown by mixing them with clay in balls and throwing them into the water where they are to grow.

OBELISCARIA.

Nat. ord., Compositæ.

O. Pulcherima.—A handsome annual, bearing rich brown crimson flowers, edged golden. A native of Texas. It is well adapted for mixed borders. They grow about one and a half feet high. Seedsmen in this country do not often supply this seed: but it is well worthy of a place in our gardens. Sow in the plains in October, and in the hills in October and keep over to flower in spring, or sow in March.

OCOTEA OR OCTEA.—*(Shrub.)*

Nat. ord., Laurineæ.

O. Bullata.—A shrub so called from the bullet-like protuberance on the leaves, which are a deep olive or brownish green. Flowers very small, green, racemose. Propagate by layering.

ŒNOTHERA.—*(Perennial and annual. Evening Primrose.)*

Nat. ord., Onagraceæ.

A genus of most beautiful as well as useful plants for borders, beds, edgings or rock work. The perennial varieties will have to be treated as annuals in the plains, and if sown pretty early will flower the first year. In hill-stations they will last for years.

They all succeed in any good rich soil. The most remarkable varieties are—

PERENNIALS.

Œ. *Grandiflora Lamarkiana.*
Œ. *Macrocarpa.*
Œ. *Laraxacifolia.*
Œ. *Camphylocarpa.*
Œ. *Macaratha Grandiflora.*
Œ. *Biennis Hirsutissia.*
Œ. *Biennis Alba.*
Œ. *Prostrata,* and many others.

ANNUALS.

Œ. *Drummondi.*
Œ. *Bistorta Veitchii.*
Œ. *Rose Mexicana.*
Œ. *Tetraptera.*
Œ. *Acaulis* and many others.

OLEA.—*(Shrub, sweet-scented.)*

Nat. ord., Oleaceæ.

These are very choice shrubs, especially *O. Fragrans,* which is propagated with much difficulty by cuttings in sand under glass. The leaves of this plant are of a bluish green, stiff, glossy, oval and pointed. It grows to about five feet in height, and bears white flowers, which are very fragrant, in bunches. There is a variety called *O. Grata* with scentless flowers, but in every other respect like the former. *O. Myrtifolia* has longer leaves than the preceding two varieties, and bears scented flowers which last all the cold season.

OPHIOPOGON.

Nat. ord., Hæmodoraceæ.

A small genus of herbs, rather more curious than pretty. Their leaves are generally sesile, linear. They thrive best in a

sandy soil. *O. Jaburan* or Snake's Beard : white flowered or tinged lilac, in dense racemes. Leaves sometimes variegated white. *O. J. Variegatus :* flowers violet blue : leaves striped white. *O. Japonicus :* flowers white.

OPHIOXYLON.

Nat. ord., Apocynaceæ.

A small shrub about two and a half feet high, bearing white flowers. Its foliage is in whorls on the summit of the stems, and is a deep shining green. Flowers white, on coral red foot-stalks. Easily cultivated. Propagated by division.

OPUNTIA.—*(Prickly pear.)*

Nat. ord., Cacteæ.

The cultivation of these is easy. Plant in ordinary soil mixed with old mortar, and be sure of good drainage.

O. Brachyartha.

O. Ficus and *Indicus :* grows wild.

O. Filipendula.

O. Maltiflora.

O. Basilaris.

O. Boliviana.

O. Platyacantha.

ORCHIDACEÆ OR ORCHIDS.

This is a subject of which I cannot treat fully in the space this book is intended to occupy : my remarks, therefore, are simply hints for those lovers of gardening who may have inclination and opportunity to cultivate orchids *to a small extent.* Those who wish to cultivate them extensively, will find books written exclusively on the subject.

In Bengal betel-houses or grass-houses are used for growing orchids in. In the North-West Provinces and Upper Bengal, where there are very dry and scorching west winds, glass-houses, covered with some protection like the top of

a betel-house *over* the glass as roofing and as shade from the sun, would undoubtedly be the best construction, as it would retain a humid atmosphere, and the grass roofing over the glass would not only shade the orchids, but prevent the glass-house being excessively hot at times when a very high temperature was not required. It might be made so as to be movable; in which case, should the grass roofing be removed, screens inside of the glass would be necessary. In hill-stations a glazed conservatory with a screen is necessary.

Orchids are terrestrial and *epephytic* or *parasitic*.—Terrestrial orchids are grown in shallow pans or rustic baskets: the latter are preferable for many reasons, as well as more ornamental. The substances used to fill these pans or baskets are rotten wood (pour boiling water over the wood before using it to destroy insects and fungi), charcoal, sand, stone, leaf-mould, broken bricks, and kunkur or unburnt gooting lime, with a little loam. Terrestrial orchids, when they look sickly in this drainage material, must be re-potted in charcoal, broken bricks, and sandstone. The materials must be used roughly, according to the size of the plant; larger plants requiring larger, or, in other words, rougher material, the smaller ones smaller and less rough material. Some varieties thrive best when attached to the stems of trees or branches cut off with the bark on them, on which they must be tied with copper wire, and when put on thus, will be benefited by their roots being bound over with moss, especially during the hot season. The use of soap and water to their leaves cannot be too strongly recommended, for in their native habitat they are far away from the smoke and dust of our town thoroughfares, high up in the branches of trees, or in mossy and hidden crevices. Tepid water, soap, and a piece of sponge should be used with a gentle hand.

When they are growing they require a plentiful supply of water; and when in a state of rest, they must have very little or none, unless it be those varieties that are evergreen,

and these will require a little more than other sorts. When they are in bud and flower they will only require moderate watering; this will be, with most varieties, after the end of February. When they are done flowering, the floor of the house they are in should be kept constantly watered so as to keep up a humid atmosphere, and the plants themselves should be watered twice a day. Even when the plants should not be watered very much, watering the floor of the house they are in will not be found in any way injurious on hot days. Many new and splendid hybrids have been produced from orchids; but to rear plants from seed and hybridize them require experience and great painstaking.

How to propagate orchids.

Renathera Aerides, *Angrecum*, *Vanda* and *Camarotis* are propagated by division of small shoots thrown up round the old plants, which may be divided from them, or the top of the plant may be cut off below the first root, and these may be placed in damp (not wet) moss or cocoanut fibre till they have started, after which they must be treated as old plants. *Dendrobiums* are propagated most readily by removing the old pseudo bulb from the plants, either during their time of rest or just after flowering, and when they are beginning to grow. For this purpose a sharp knife should be used, so that the bulbs are not mutilated. Be sure in dividing that the portion cut off has some roots attached to it. These should be potted off, and no water given to them till they have begun to grow. Others again, such as *Stanhopeas*, *Epidendrums*, *Cœlogynes*, and *Cattleyas* may be increased by cutting them in pieces of equal lengths, and old stems having a few roots and a new bud attached to each piece.

Such orchids as have only a single series of pseudo bulbs must be divided, but not removed till new bulbs have formed on the cut pieces, when they may be separated and potted.

Some species again propagate themselves by forming buds on the axis of their leaves. These buds in time send

out leaves which may be cut off when they have in their turn formed leaves. The different modes of growth will themselves suggest to the observant cultivator the treatment to be pursued for propagating orchids; but for those who may be afraid to injure them, or to those who think they can propagate them when they are ignorant of the mode to pursue, these notes will prove useful, and save the orchids from being destroyed. Further on, however, directions will be found as to propagation.

In hill-stations orchids will require heat, and for this purpose a large sized fish-kettle or a large sized common kettle filled with water, according to the size of the conservatory, may be placed over an "angethi" or brazier, and be brought to a boil to raise the temperature, and this may be easily done if the conservatory is kept closed, and the temperature regulated by ventilation or by removing the brazier and kettle. Every conservatory should have a thermometer in it.

During the hot and dry months, the orchid-house will require a cool or rather a mild atmosphere; this may be secured by *tatties* made of grass being placed opposite the windward side sprinkled with water (this may be done in the plains). The use of tepid water, soap and a sponge is necessary to keep the leaves clean.

How Orchids should be treated throughout the year.

January.—When plants show signs of growing, take precautions to make the necessary arrangements for shifting and surface dressings, using the materials before recommended. When rotten wood is used, pour boiling water over it first to destroy all fungi and insects. If the temperature is below 50° F., heat is necessary.

February.—Growing plants must be put in the most conspicuous situations so as to be readily attended to. Water them *slightly* if they require it, and sprinkle the floors and walls twice, even thrice, a day, or oftener, with water to keep up a humid atmosphere. Destroy insects and shut up holes

made by them with liquid gum and water and glue. If insects have injured any plant very much, dip it in gum and water, put it in the shade, and after two days syringe and wash it with water at 100° F. Temperature during the day should not exceed 65° F., and at night not below 50° F.

March.—Shift and surface dress those that have now started into growth. Use more water than was used last month on floors and walls. Slightly water those orchids that may be in bud or flower. In preference to giving air, withdraw all plans of heating, or lessen it if that be in use.

April.—The atmosphere must be made as humid as possible by sprinkling water on floors, walls, etc, temperature ranging from 65° F. to 85° F. Sprinkle or syringe orchids in bud and flower; water those well that have finished flowering (this is applicable to all orchids after flowering). Shade from excessive sun's rays.

May.—Most of the orchids will be in flower. Shade during excessive sun. Preserve a very humid atmosphere, and dip orchids in water of the same temperature as the house. Do not water plants, such as *Dendrobiums*, with bulbs approaching maturity.

June —Water all plants well that are growing freely, and keep up a humid atmosphere. Withhold water gradually from plants reaching maturity, such as *Dendrobiums*, and remove them to a cooler place if that can be done.

July,—Ditto in every respect.

August.—Some orchids will be inclined to rest now, such as *Dendrobiums*, *Epidendrums*; these should be kept cool and in a drier atmosphere to induce them to rest. Syringe liberally immovable and large plants, and dip baskets once a week, also portable blocks, in tepid water *(the temperature of the house)*; this applies to plants yet growing and for which a humid and warm atmosphere is yet necessary, such as *Lælias*, *Barkerias*, etc.

September.—The temperature of the orchid-house should be reduced a little now. Shade a little on very sunny days and water less, except those plants yet in flower. Air may be supplied on fine days.

October.—Such plants as are yet growing still require water in quantities proportionate to their growth. Temperature should be from 70° to 60° F.; if it is more than this, the plants may shoot again and come into growth.

November.—A drier atmosphere must be maintained to obtain rest for the plants for the next two months at least. Temperature from 70° to 55° F. Stop dipping baskets and blocks, only syringe slightly.

December.—Some plants may just be showing signs of growth: these must be placed in the warmest situations, and their growth must not be checked.

I am indebted for these notes to an abridgment made by myself from a well known work on orchids. I may as well remark here that the period of growth in this country is the same as in England, and the period of rest is also the same. The close of the season of rest is considered, by most experienced gardeners, the best for re-potting, and just when they have started into growth; while some consider the best time after they flower, or about the month of July *(in most of the orchids)*; previous to their being re-potted they should receive no water for a few days. After they are potted they should be elevated a little above the rim of the pot or basket, to allow the water to have a perfectly free passage. In this lies the chief difficulty; for during the hottest season they are in full growth, and must be constantly kept moist, and the water finds such a free outlet that the plants soon dry. Therefore the necessity of careful watering at this time. A good deal of this difficulty is overcome by having a glass conservatory, which helps to keep the air humid.

Some kinds of orchids grow best in moss alone, such as *Vandas, Aerides, Vanillas, Saccolabiums, Epidendrum, Nocturnum* and *Dendrobium formosum.*

DENDROBIUMS.

This is a very large genus of orchids, in which India is prolific. Many of them are most beautiful and well suited for the beginner or amateur to start with should he have a hobby for orchids, as, generally speaking, they are of easy culture and natives of a moist climate. Bengal suits them. Lower Bengal has a much more moist climate than Upper Bengal, it is true, but in Upper Bengal, where westerly winds prevail in March and April, the orchid house must have the side the wind comes from completely closed, or a tatty must be put up and kept constantly moist with water, which is easily done by having a trough with small holes bored in it above the tatty, and the trough always replenished with water all day. The floors should be of sand and walks of gravel, and these must be sprinkled with water. It is best to have a small tank of masonry all the length of the orchid house, which would not only supply the water, but be an ornament, by ways which would easily suggest themselves to the greatest tyro according to his means. There is nothing that can be better in the plains than a grass-house, with the added suggestion in the first part of this subject—that is, glass to keep in a certain amount of moist atmosphere—for all orchid culture.

I do, however, think if such a structure were all underground, and with a grass roof and a glass one which was removable under it, it would be all the better, but I do not know of it having been tried. I mean this to apply to those portions of India where the climate at some time of the year is very dry; generally from February to June.

D. Aggregatum: quite a dwarf plant and very lovely with its deep orange flowers.

D. Aggregatum majus has larger flowers. I have seen these growing on a tree in the open garden in Calcutta most luxuriantly.

D. Andersoni: pure white scented flowers. *D. Albo Sanguineum:* white and crimson.

D. Amœnum: pure white, tipped violet, purple scattered all along the stem. Violet scented.

D. Aphrodite, amber color, borne on nodes. *D. Aqueum*, creamy white, large. *D. Aureum*, golden, borne from the nodes of two-year-old pseudo-bulbs. *D. Bensoniæ*, white with orange spot and two large black spots, borne at the end of the pseudo-bulbs. *D. Boxallii*, white, tipped purple. Lip with a blotch of rich yellow. *D. Chrysotis*, golden yellow. Lip orange with purple blotches, fringed. Borne in drooping racemes. *D. Clavalum*, bright yellow with crimson spot on the lip. *D. Crassinode*, white, tipped purple. Lip white with orange blotch *D. Crysallinum*, white, tipped rose or purple. Lip orange, tipped purple. *D. Dalhousianum*, flowers large, buff, shaded lemon. Lip spotted at the base with blotches of crimson, and margined rosy pink. *D. Densiflorum*, rich amber, in racemes. Lip orange, fringed.

D. D. Albo-luteum, white, sometimes tinged pink. *D. Devonianum*, white, tinged pink, tipped purplish magenta. Lip white, margined purple, spotted orange at the base and frilled. *D. Draconis*, white. Lip red at the base. *D. Falconeri*, white, tipped purple. Lip the same, but a centre of dark purple, margined orange. *D. Farmeri*, flowers in racemes, like *D. Densiflorum*, but pale straw color, tinged pink. Disk of lip golden yellow. *D. F. Aureoflavum*, deep rich yellow. Lip deeper colored. *D. Fimbriatum*, thin texture of flower, deep orange, margined with a fringe on the lip like moss. Racemes hanging with six or more flowers. *D. F. Oculatum*, the flowers are larger than the last mentioned, and the lip is blotched blackish-purple or dark blood color. *D. Formosum*, a lovely orchid. White lip with orange throat. Flowers very large.

D. Fytchianum, flowers in racemes nine inches long, white. Lip three-lobed, purplish-rose. *D. Infundibulum*, flowers ivory white. Lip serrated, yellow, the lateral sepals prolonged into a tapering spur. *D. Jenkinsii*, much like *Aggregatum*, but even more dwarf and a pale color of yellow or buff, margined yellow. *D. Lituiflorum*, like *Nobile*, but smaller, rosy purple. Lip white, bordered purple, and dark purple centre, curved trumpet-like upwards. *D. Longicornus majus*, white fringed. *D. Luteolum*, primrose yellow. Lip slightly marked orange and crimson. *D. MacCarthiae*, large, 3 inches long, 3¼ inches broad, in drooping racemes, rich cerise blue. Lip lighter, scoop-shaped, veined purple, blotched with a dark spot within. *D. Macrophyllum*, greenish yellow, hairy. Lip three-lobed, striped and spotted purple. This is a Phillipine species. *D. Moniliforme*, white, sparsely dotted purple on the lip. Exceedingly fragrant. Native of Japan and China. *D. Moschatum*, creamy white, tinged rose. Lip slipper-shaped, yellow, base darker blotch of blackish-purple, produced in racemes. *D. Nobile*, flowers large, white, tipped rosy pink. Lip white, rosy pink in front, blotched at base deep velvety crimson. Choice. *D. Pierardii*, creamy white to pinkish all along the stem. Lip primrose with a few purple lines at base. *D. Primulinum*, flowers in two rows along the stem, pinkish-white. Lip downy, large, shell-shaped, faintly tinted blue. *D. Pulchellum*, pinkish white. Lip rose with orange base, margin fringed. *D. Sanguinolentum* or blood stained, flowers in bunches on the upper part of pseudo-bulbs, amber, veined rose, tipped purple. Lip large, point heavily marked purple. *D. Scabrilinque*, at first greenish, turning to white, barring the lip, which is shaded green and yellow and striped orange. Very fragrant, like Wall-flowers. *D. Speciosum*, creamy white, fragrant. *D. Suavissimum*, very fragrant, rich yellow. *D. Superbiens*, light purple, sometimes claret, shaded brown spikes bearing from 8 to 12 flowers. A grand orchid from the Phillipines.

D. S. Anosmum, rosy pink. Lip purple. Manilla. *D. Wardianum*, flowers thirty to forty to a pseudo-bulb. Sepals and petals white, upper portion rich magenta. Lip large, white above, rich orange in the lower parts, with two spots of crimson-magenta. Varieties *Candidum* and *Lowii*.

These are the best Dendrobiums to be got, and should give amateurs a large choice of truly lovely orchids. These may be grown in pots or on the limb of a tree.

Cœlogyne.

Very handsome epiphytal orchids, mostly from the hills in India. Probably it is best to grow these generally in pots. *C. Asperata* from Borneo. Pale cream colored. Lip marked chocolate and yellow veins and streaks. *C. Barbata*, purest white. Lip three-lobed or trifid, with sepia-brown marking. Native of Assam. *C. Corrugata*, white. Lip with yellow plate in front, veined orange. Himalayan. *C. Cristata*, to be found all along the Himalayas. Flowers fragrant, snow white. Lip blotched yellow, veins fringed golden. Pseudo-bulbs smooth, shining, somewhat oblong, apple green. Very fine. *C. Flaccida*, from Moulmein and Nepaul. Heavy odour, color white. Lip stained yellow and streaked crimson towards the base. *C. Hookeriana*, rose-purple, white, brown, yellow. A pretty species from Sikkim. *C. Humilis*, white, tinged rose. Lip white, spotted and streaked crimson and brown and transversely with six veins, fringed. *C. Maculata*, white. Lip prettily barred crimson, bracts inflated, pale green. Pseudo-bulbs depressed. Kassia hills. *C. Massangeana*, light ochre. Lip trifid, maroon brown, with ochre veins. *C. Media* creamy white. Lip yellow and brown. *C. Ocellata*, white. Lip fringed or crested, streaked and spotted yellow and brown. *C. Odoratissima*, pure white. Lip stained yellow. Sweetly scented. *C. Pandurata*, lovely green. Lip marked with raised ridges running parallel of black. Sweetly scented. *C. Speciosa*, flower large, three inches, brownish or olive green.

Lip very pretty, fringed, ground color yellow, marked dark red and dark brown. *C. Wallichiana*, bright rose. Lip marked down the centre white. Sweet-scented. Kassia hills.

PHAÏUS OR PHAJUS.

Terrestial orchids, best grown in pots. *P. Albus*, white, terminal drooping, in racemes. Lip with a disk of yellow, veined rose, denticulate. *P. Bensonae*, rosy purple, whitish towards the centre. Lip deeper in color, deep yellow crests on disk. Flowers borne on top of the stem in a short raceme. *P. Maculatus*, flowers yellow, in great profusion, and *P. Wallichii*, orange yellow or buff, tinged purple—lip yellow with brown throat—are the kinds best known. *P. Bicolor*, reddish-brown—lip rose, yellow and white—is a grand species, with flowers four inches in diameter. *P. Grandifolius*, *P. Irroratus*, *P. Tuberculosus*.

ARUNDINA.

A. Bambusifolia, a native of Nepaul, best grown in pots; bears purple flowers. Of easy culture.

EPIDENDRUM.

A large genus of over 300 species, few of which are worth cultivating, being dingy in color. Some, however, are more handsome, and some are grown for their sweet scent. Very few of these have been cultivated in India, probably not more than a dozen species. *E. Bicornum*, flowers purest white. Lip with a few crimson spots. Spike from the top of the pseudo-bulb, from ten to twelve flowers. *E. Lindleyanum*, syn *Barkeria Lindleyanum*. *E. Nemorale*, mauve or rosy lilac. Lip striped violet. *E. Falcatum*, greenish yellow. Lip brighter yellow. *E. Dischromum*, light rose. Lip three-lobed, rich crimson. Flowers in large panicles. Var. *Striatum*, petals white, with deep purple line. *E. Autropurpureum*, dark rose or purple; dark blotches, crimson or rose colored lip. *E Auranticum*, bright orange. Lip striped crimson: flowers produced from a sheath on top of the bulb.

E. Enemidophorum, light yellow, spotted brown inside, pure white at back. Lip shaded white and rose. Spike terminal, in drooping racemes. *E. Prismatiocarpum*, yellowish green, spotted purple or black. Lip lilac-purple, edged white, fragrant. Ten or twelve flowers on each erect raceme. These are about the best.

Broughtonia.

B. Sanguinea, flowers large, blood-colored, produced in a terminal panicle. Twin leaves which are oblong. From Jamaica. Flowers well in Calcutta.

Cattleya.

A truly splendid genus, often producing flowers seven to eight inches in diameter. Closely allied to Lœlias, from which it is distinguished by possessing four pollen masses. The flowers are produced from the tops of the pseudo-bulbs, which generally have one leaf on them. They should be watered with a watering can in preference to a syringe, and should, when grown on blocks, be occasionally dipped in water. *C. Aclandiae*, twin flowered, chocolate-brown, barred irregularly yellow. Lip large, and spreading rich rose to purple. *C. Amethystoglossa*, rosy lilac, spotted and blotched beautifully with purple. Lip deep rich purple. *C. Lobata*, flowers deep rich rose. *C. Marginata*, flowers large, scented, rosy crimson Lip deep rose, edged white. *C. Maxima*, flowers even rose color of a pale tint, as fading becomes deeper. Lip large, almost white, veined dark purplish crimson, and streaked in centre orange. *C. Mossiae*, very large flowered, blush or rose. Lip large, blush or rose, sometimes frilled or crimped. This is one of the finest, and its varieties are numerous: some of them are *C. M. Aurantiaca*, *C. M. Aurea*, *C. M. A. Grandiflora*, *C. M. Grandiflora*, *C. M. Grandis*, *C. M. Majestica*, *C. M. Superba*. *C. Crispa*, white, or white shaded lilac. Lip velvety crimson with narrow white crisp margin. *C. Trianae*, flowers blush. Lip blush or rose, throat orange or yellow, front intense purple. Its variety, *C. T. Dodgsonii*, is very fine

and very large, 8 to 9 inches. Lip deep crimson, throat orange-yellow; also *C. T. Colemanii*, flowers 8 inches. Sepals and petals tipped rose, throat striped yellow. Lip fimbriated, deep rose. *C. Warscewiczii*, purplish-white. Lip crimson, very fine and large. *C. Citrina*, distinct. Flowers bright lemon-yellow, produced from young pseudo-bulbs. Pseudo-bulbs small, oval, coated with a silvery membrane when young. *C. Gigas*, flowers very large, pale rose. Lip large and broad, rich deep purple or crimson-violet in front, two yellow blotches at base. *C. Eldorado*, large flowers of a pale pink. Lip the same color, but the front stained purple-crimson, back of throat orange. *C. Guttata*, flowers green, tinted yellow, dotted with crimson. Lip white, stained purple. Scape erect. Varieties *C. G. Leopoldii*, deep chocolate with dark red spots; flowers numerous and very fragrant. Lip deep rich red-purple. *C. G. Russelliana*, a very handsome variety of Guttata, taller and larger, with larger and darker flowers.

Lœlia.

These are known from Cattleyas only by having eight pollen masses instead of four as in Cattleyas. *L. Anceps*, *L. Majalis*, *L. Purpurata*, *L. Acuminata*, *L. Autumnalis*, *L. Albida*, and *L. Dayana* are varieties mentioned by Firminger as being cultivated in Calcutta. These being terrestial orchids are best cultivated in pots. In fact both Cattleyas and Lœlias are best cultivated in this way in India.

Brassavola.

Epiphytal orchids with large flowers. Pollen masses eight. Leaves solitary and succulent. *B. Acaulis*, flowers large, with sepals and petals long and narrow, greenish and creamy white. Lip heart-shaped, base spotted dull rose. Leaves rush-like. *B. Digbyana*, flowers 4 inches, creamy white. Lip streaked purple in centre and fringed. *B. Glauca*, sepals and petals yellow. Lip orange with a white throat. *B. Gibbsiana*, white, spotted chocolate, large A rare species,

with broad thick leaves; requires to be potted in peat and moss. *B. Lineata*, creamy white. Lip pure white. Very fragrant. *B. Venosa*, cream. Lip white.

Brassia.

Nearly allied to Oncidium. American orchids. "Distinguished by its simple inflorescence, elongated tail-like sepals and short column, which is quite destitute of the side lobes or ears that form a marked feature in the species of Oncidium." Brassia thrives in pots or baskets; the drainage being perfect, potted in peat broken up the size of walnuts, and well watered during spring and summer, and little in autumn and during the cold season. *B. Antherotes*, 7 inches, yellow, brownish-black at the base, long and narrow, tapering. Lip triangular, yellow, barred brown. Spike 2 feet. *B. Caudata*, yellow, barred brown, 4 to 6 inches. Lip yellow, spotted greenish-brown. Spikes, when plant is strong, drooping, 18 inches. *B. Lanceana*, lanceolate, sepals and petals very tapering, bright yellow, blotched brown, sometimes red. Lip yellow, very slightly spotted, and much waved. Very fragrant. A fine species. *B Lanceana Macrostachya* or large spiked, rich yellow, sparingly spotted brown sepals, 5 inches, in tail-like appendages. Lip clear yellow. From Demerara. *B. Lawrenceana* bright yellow, spotted cinnamon and green. Lip yellow, tinted green. And its variety, *B. Lawrenceana longissima*, deep orange-yellow, spotted chiefly at base, reddish-purple sepals, 7 inches, in long tail-like appendages, 2½ inches broad. Lip pale yellow, dotted at the base with purple. Very fine variety. *B. Maculata*, yellow, spotted irregularly with brown. Sepals much shorter than usual in the species generally. *B. M. Guttata*, a variety of the last, with larger sepals; petals yellowish-green, blotched brown. Lip broad yellow. *B. Verrucosa Grandifolia*, twice the size of species Verucosa. Flowers greenish, blotched blackish-purple. Lip white, warty. A rare variety, but the best of the genus.

ONCIDIUM.

Known by the ears or warty crests at the base of the lip. Some of these have been introduced in Calcutta, and have grown well. The flowers are various in form and size, but in color yellow predominates. They are epiphytal orchids, but grow well in pots or baskets. Some are found at high elevations, others in hot valleys. Some grow in the sun and some in shade. *O. Aemulum*, dorsal sepal cinnamon; lateral sepals longer, yellowish-brown; petals bright cinnamon; segments wavy or crisped. Lip marked purple-violet, yellow at base. A very good species. *O. Macranthum*, flowers 3 to 4 inches, sepals and petals roundish, leathery, golden, tinged purplish-brown or purple-red. Petals often streaked crimson. Lip hastate, with a crest of white, fleshy, and the middle lobe yellow and lateral ones purple-brown. *O. Lanceanum*, very fragrant, vanilla-like. Yellow, tinged green, thick and fleshy, barred and blotched chocolate brown. Lip large, rich violet in lower portion, rose above. Spike erect. A handsome plant, perhaps the best of the genus. Sometimes the lip in this species is pure white. *O. Forbesii*, distinct pale yellow edges, centre reddish-brown. A handsomer species than *O. Crispum*, to which it is allied.

O. Grandiflorum, *O. Flexuosum*, *O. Jonesianum*, *O. Incurvum*, *O Divaricum*, *O. Marshallianum*, *O. Papilo* are of a remarkable species (the butterfly plant) and deserve to be described. Flowers pale yellow, barred chestnut brown, resembling a butterfly in shape in some degree. Sepals long, narrow and upright Petals horizontal, forming the wings. Lip forming the body. Leaves olive green, streaked and spotted brown. The old spikes should not be cut off, as new buds develop on the apex. It should be exposed to sun and good light. *O. Serratum*, *O. Ornithorhynchum*, soft rosy purple, perfumed. Flowers small, but numerous. *O. Rupestre*, *O. Splendidum*, green, barred brown. Lip golden. *O. Varicosum*, *O. V. Rogersii*, *O. Warscewiczii*, *O. Wentworthianum*. The above include about the best of the genus.

Angræcum.

These belong to the tribe Vandeæ and are epiphytal orchids, peculiar for the long, hollow, tail-like spur hanging from the base of the lip. The flowers last a long time in perfection. They grow best in crocks, charcoal and moss at the bottom of the pot, and over that charcoal and crocks just sufficient to support the plant, then moss, well pressed down in a cone shape, to within a couple of inches of the leaves. *A. Arcuatum*, white, from the axils of the two-year-old leaves. *A. Bilobum*, white, tinted rose, spur 2 inches. *A. Caudatum*, greenish-yellow and brown. Lip white, spur greenish, thick, 9 inches long, two-lobed below, racemes 1 foot or more long. *A. Eburneum*, greenish-white. Lip very large, white, racemes 18 inches long. *A. Ellisii*, fragrant, white, 2 inches. Sepals and petals reflexed, column prominent, spur pale brownish, 6 to 8 inches, racemes 2 feet. *A. Kotschii*, yellowish-white, scented. Spur tinted red, 6 to 7 inches, distinguished by two spiral twists. Racemes 18 inches. *A. Pertusum*, distinct, pure white. Spur short, marked with a distinct yellow tint. Leaves arched, 10 inches. *A. Scottianum*, pure white, delicate in texture. Lip uppermost, 1 inch across. Spur narrow, yellowish, 3 to 4 inches. *A. Sesquipedale*, probably the best of the species. Ivory white, 6 to 8 inches across. Spur 10 to 18 inches long. Leaves 10 inches. Height 1 foot

Cimbidium.

These are not attractive orchids. *C. Mastersii*, *C. Giganteum*, *C. Eburneum*, *C. Elegans*, *C. Aloifolium*, *C. Lancifolium*, *C. Parhii*, *C. Lowianum*: they are easily grown on the fork of a tree. *Mastersii* and *Elegans* are about the best, bearing white sweet-scented flowers.

Chysis.

A genus of a few species only, well worthy of introduction. They should be cultivated just like Vanda. Their flowers are of bright showy colors. Lips beautifully marked.

Bulbs fleshy, about a foot long. Flowers on new growth. *Chysis Aurea*, yellow. Lip marked crimson. *C. Aurea Lemminghei*, pink and rose. *C. Bracktescens*, white. Lip three-lobed, saddle-shaped, yellow blotch in centre: flowers 2 to 3 inches across. *C. Lævis*, yellow and orange. Lip blotched crimson or scarlet and fringed round margin. American orchids.

Aerides.

Epiphytal orchids of the old world. They are of easy culture generally speaking, and almost all well worth growing. First grown on blocks and then put in a pot filled with charcoal, potsherd and live moss. From January or February they may be freely watered in the plains right on to September. *A. Affine*, rose. *A. A. Superbum*, brighter rose than the last. *A. Brookii*, flowers white. Lip purple. Fragrant. *A. Crassifolium*, purple dotted leaves, segments tipped purple; said to be the finest species of Aerides. *A. Crispum*, white, suffused rosy-purple. There are several varieties of this. *A. Fieldingii* (fox brush aerides), common, in dense racemes, mottled rose. *A. Falcatum*, white, dotted reddish-crimson, tipped rose. Lip white, rose centre. *A. Odoratum*, white, tipped pink, very fragrant, common in Calcutta. *A. Quinquivulnerum*, white, marked with reddish blotches. Racemes longer than the leaves, pendulous. *A. Lobbii*, white in centre, tinted blush at edges Lip whitish in centre and stained violet on each side. *A. Suavisimus*, white, tipped and tinged deep lilac. Lip three-lobed, denticulate, lemon color. Leaves speckled brown. *A. Roseum*, rose with darker spots. Lip flat, acute, bright rose freckled with a darker rose. Racemes dense, many flowered, over a foot long. *A. Houlletianum*, buff, shading off to cream, and purplish eye at tips. Lip white, front dark purple with lines of same color at the sides. *A. Japonicum*, *A. Roseum Superbum*, more robust and darker than the species. *A. Virens Ellisii*, flowers large, white, suffused rose, tipped amethyst. Lip large, side lobes white, freckled at base, with short lines of amethyst, middle lobes

rich amethyst. Racemes 18 inches long, of 30 to 40 flowers, which are large. *A. Williamsii*, pinkish-white, in great abundance. Scarce and pretty species. *A. Rubrum*, *A. Expansum Leoniae*, *A. Maculosum*, pale rose, spotted purple. Lip flat, undivided, rosy-purple. Racemes pendulous. *A. Quinquivulnerum Farmeri*, flower striped (not blotched). Lip deep orange. Racemes densely crowded. Borneo.

CALANTHE.

Terrestial orchids, most of them from India, some from Japan and Archipelago. *C. Masuca*, deep violet. Lip intense violet-purple. *C. Petri*, whitish yellow. *C. Seboldii*, large, yellow. *C. Textori*, creamy white, flushed violet on petals and column and base of lip. Calli brick red, changing to yellow. Lip very narrow. Japanese species. *C. Vestita*, white, many flowered. Leaves deciduous. Var. *C. V. Igneo-oculata*, base of column purplish and dazzling fire color. Blotch at base of lip the same color. Var. *C. V. Nivalis*, pure white. Var. *C. V. Rubro Oculata*, white with blotch of rich crimson in centre of flowers, which are large, 2 inches across. Spikes drooping, white, downy. *C. V. Turneri*, pure white, rose colored eye. Larger and longer flowered spikes than the species. Java.

VANDA.

Very beautiful epiphytal orchids, natives largely of India and the Malayan Archipelago, most of which are showy, shortly pedicillate, often fragrant. Pollen masses two. Stems leafy, not with pseudo-bulbs. They require more light than most orchids, and many growers and many successful cultivators grow them in the sun, using no shade at all in England, but it is best to shade most of them for a portion of the day in this country on the plains. The lovely species, *Vanda Cœrulia*, requires less heat than the others, and *Vanda teres* requires bright light, even sun, and lots of water when growing. It may be seen growing on the summits of trees in Chittagong in

quantities, where the rainfall is very small from January to May. Only one species of Vanda has been found in Tropical Australia. The best mode of growing them is in a pot or basket with a branch planted in the centre of it among pots-herd with a little sphagnum: three-fourths of the pot being filled with this, and the remainder with live sphagnum: the Vanda plant being tied to the branch with copper wire. *V. Caerulia*, sometimes when well grown 5 inches across. Flowers pale blue. Lip deep blue, small and coriaceous-obtuse, with two diverging lobes. Racemes 10 to 12 flowered or more. Scapes erect and longer than the leaves. *V. Caerulescens*, flowers mauve-blue, on a slender erect axillary scape, 10 to 12 or more in number. Lip violet, emarginate with lilac-purple auricles, and spur tipped green. Variety *Vanda Caerulescens Boxalii*, white, tinted lilac. Lip dilated, deep violet, bordered white, and disk striped dark blue. Scape short, racemes rather close. Variety *Vanda Caerulescens Lowiana*, like *Boxalii*, but with amethyst blue, middle lobe of lip and the ends of the petals with a dot of amethyst blue. *V. Cathcarti*, "3 inches across: sepals and petals white outside, yellow with reddish-brown bands internally, sessile, concave, roundish-oblong. Lip three-lobed, the lateral lobes white, red streaked at base, small, the middle lobe being whitish with a yellow, crenate, incurved border: disk with two erect calli: scape erect, leaf-opposed, four to five flowers." Sikkim. *V. Concolor*, white outside, cinnamon-brown within. Lip three-lobed, downy within base, side lobes white with rosy dots, the middle one cinnamon-brown, bilobed at apex. *V. Cristata*, flowers yellowish-green, petals incurved. Lip buff, striped rich purple, divided at the end to three acute, narrow, diverging and unequal lobes. *V. Hookeriana*, white, tinted rose. Petals larger than sepals, white, spotted magenta, undulating. Lip three-lobed, white, lined and spotted magenta-purple. Purple auricle on each side of column. Leaves erect, 2 to 3 inches long, terete, pale green, subutate-pointed. Borneo. *V. Insignis*, flowers light-brown, spotted chocolate

internally, yellow-white outside. Lip almost fiddle-shaped, large, the side lobes being white and short, the centre or front one white, suddenly expanding to a concave semi-lunar limb of light purplish-rose. Five to seven-flowered raceme, which is as long as the leaves. Leaves channelled rigid linear-ligulate, curving, unevenly denticulated or toothed at apex. Variety *V. I. Schröderiana*, light yellow. Lip pure white with a large anterior concave limb. A chaste variety. *V. Lamella Boxallii*, sepals and petals creamy white, the inner part of the lateral ones reddish-brown, tinged purple Petals white. Lip limb magenta-rose in front, the disk having 6 reddish-purple stripes from back to front of mouth of tube. Flowers in racemes of 14 to 20 flowers. Leaves much recurved. Stems erect. *V. Parishii*, flowers greenish-yellow, spotted reddish-brown, acute. Lip front lobe pale magenta with a narrow margin of white auricles, white, striped orange. Scape erect. *V. Parviflorum*, pale yellow. Lip funnel-shaped, rounded, front lobe white with purple crests on the disk and dotted lilac. Leaves bilobed at apex. *V. Roxburghii*, the commonest orchid in Bengal and elsewhere. To be found on mango and other trees. Pale green with chequered lines of olive-brown. Lip violet-purple. *V. Sanderiana*, flowers pink, stained buffy-yellow, 4 inches across. Lateral sepals pale nankeen yellow outside, greenish-yellow within, reticulated crimson. Lip small, concave, pale reddish-purple at base, tip chocolate-purple. Flowers many in racemes, axillary. Phillipine Islands. *V. Suavis* (sweet) fragrant. Large and handsome flowers, white outside, spotted and barred blood-purple within. Lip convex, three-lobed: front lobe three-lobed, pale rosy-purple: lateral ones deeper colored. A fine species. *V. Teres*, large flowers, sepals oblong, and the dorsal one white, tinted rose, lateral ones twisted parallel with the lip. Petals rose-magenta, lighter towards margins, larger, undulated. Lip bright magenta-rose, strongly veined, cucullate, large; spur conical; racemes leaf-opposed, generally two-flowered. Handsome straggling climbing species. Varieties *V. T. Andersoni*,

V. T. Aurorea, *V. T. Candida*, *V. Tricolor*, very fragrant and handsome. Pale yellow flowers, dotted brownish-red. Lip middle lobe rose-magenta, paler at the lip; disk marked with five white lines; basal lobes white, erect, rounded; spur white; column white, short, thick. Racemes short, dense, axillary peduncle. Varieties *V. T. Dalkeith*, a very highly colored form, and *V. T. Downside*, very large-flowered and rich color, and markings. *V. Vipani*, sepal and petals blunt, white externally, within pale at the base marked with short brownish-purple lines, the remainder of the sepals brownish-olive, and the petals inclining to ochre: all striped brownish-purple; mid-lobe of lip olive-green, side auricles yellow. Leaves very long and narrow. *V. Amesiana*, *V. Clarkei*, *V. Dearei*, *V. Sanderiana albata*.

RENANTHERA.

These plants thrive well in the gardens in Calcutta, and are grown tied on to a log placed erect in a pot. These are Chinese orchids and require full exposure to sun. *R. Coccinea* and *R. Lowei* are the best for amateurs' cultivation. The pots should be filled with sphagnum. *R. Coccinea*, blood-red flowers in large panicles. *R. Lowei*, flowers of two kinds on the same spike, lowest pair tawny yellow enlivened with crimson dots, the remainder pale green, almost hidden on the inner side by large irregular blotches of reddish-brown. Sepal and petals waved, lowest pair the most blunt. Spikes 6 to 12 feet long with 30 to 50 flowers. *R. Storiei*, orange, 2 inches across, lower petals brilliant velvetty-crimson with small yellow bars, centre white: a delicate species and rather rare. *R. Moluccanum*, red-dotted. *R. Matutina*, blood color, paler outside, disk of lateral sepals golden. *R. M. Breviflora*, a distinct variety with shorter sepals. *R. Dougata*, purplish. *R. Histrionica*, yellow bordered with purplish blotches. Lip white, with purplish blotches on the side lobes. *R. Imschootiana*, upper petals and sepal buff-yellow, dotted red; two lower sepals much larger, crimson.

Bletia.

A large genus of very pleasing and easily grown terrestial orchids when once thoroughly established. Their leaves are grass-like and their pseudo-bulbs roundish or flattened. They thrive in a compost of loam and leaf-mould. *B. Hyacinthina*, flowers purple, racemose. *B. Vericunda*, like the former, purple *B. Shepherdii*, purple with yellow down the centre of the lip. *B. Sherrattiana*, petals very broad, twice that of the sepals. Lip with yellow down the centre. A dozen flowers on a spike. *B. Gracilis*, pale greenish white, lip red and yellow. *B. Florida*, pale-rose. *B. Campanulata*, deep purple, white centre.

Spathoglottis.

These are terrestial orchids, natives of the Malayan Archipelago, East Indies, Pacific Islands, Australia and South China. They require the same treatment as Bletias.

S. Aurea, golden yellow. Lip marked with a few lines of blood-red. *S. Fortunei*, yellow. Lip blotched red. *S. Lobbi*, sulphur-yellow. *S. Pacifica*, whitish lilac with darker markings. Lip lilac, edged yellow. *S. Petri*, dark lilac. Lip purple with white disk. *S. Rosea*, rose-colored. *S. Tomentosa*, crimson. *S. Plica*, purple.

Saccolabiums.

These are generally East Indian Orchids. They require the same treatment as Aërides, except that they are probably best grown in baskets or pots, and do not require much shade, but lots of light.

S. Giganteum, perfumed. Flowers white, in long, dense, drooping racemes, freely produced. Sepals and petals spotted amethyst. Lip pretty mauve-violet. *S. Acutifolium*, flowers in small corymbs, yellow. Lip pale pink, concave at base, rounded lobe at each side. *S. Berkeleyi*, flowers large, white, in loose racemes, petals and sepals spotted and striped amethyst. The anterior of lip amethyst. *S. Bigibbum*, sepals and petals

pale yellow. Lip white, triangular, with broad blunt spur, edges frilled, centre yellow. Flowers produced in a drooping raceme, about 8 in number.

S. Calopterum, rich purple, white at the base of sepals and petals. *S. Borneense* (Borneau), ochrous cinnamon, in nodding dense racemes. Spur of lip calvate and depressed. *S. Cœleste*, sepals and petals tipped sky blue, blunt. Anterior of lip blue. Compressed recurved spur of a blue tint on both sides of its centre. Probably Moulmein. *S. Curvifolium* (curved leaved), cinnabar-red flowers, small, crowded, in erect axillary racemes. Handsome compact species. *S. Gurwalicum* (Gurwal), white. Lip amethyst, sometimes blotched on the sepals and petals. Spur hairy inside. *S. Rubrum*, fine deep-rose, in dense, erect, axillary racemes, 6 inches long. Compressed spur. *S. Turneri*, lilac, spotted, very beautiful Densely produced in racemes 2 feet long.

S. Violaceum, flowers very numerous, in showy axillary racemes 1 to 1¼ feet long. Flowers white, spotted mauve. Lip of a dark mauve marked with deeper colored lines. *S. V. Harrisonianum*, very sweet-scented, pure white, large, in dense axillary racemes sometimes 2 feet long. *S. Retusum*, flowers waxy white, spotted pink. This is a robust species. *S. Pumilio*, flowers small, in bent cylindrical dense racemes. Sepals and petals yellowish. Lip white with purple markings on the blade. *S. Miniatum*, small brilliant orange-red flowers, in a small cylindrical raceme. *S. Minimus*, flowers rose-purple, tipped green. *S. Hendersonianum*, sepals and petals pretty rose color. Lip bright amethyst color. Flowers numerous, in erect axillary racemes.

Odontoglossum.

These are American orchids of great beauty, but being plants that require cool treatment, are not at all suitable to be cultivated in the plains of India. However, those who would wish it, could cultivate them in a conservatory in the hills, to which they are adapted. Those from the warmer

regions have been cultivated out of doors, in some instances most successfully in the shade of trees, in England. Those grown in a cool house do not require a resting season as a rule, and should be kept uniformly moist: they should not be exposed to direct sunshine in summer. Generally *Odontoglossums* grow best in pots or baskets, in a mixture of peat in lumps the size of walnuts, charcoal and a little sand scattered in it, and sphagnum. The pots should be half full of crocks for drainage. On the top of the pot after planting the orchid some fresh sphagnum should be placed. Newly imported plants require hardly any soil, and should be put into small pots nearly full of crock alone. They should on no account be forced by heat. These precautions must be taken, or the plant will start into growth rapidly, and thus be weakened and probably killed. As so little is known about the growing of them in this country, the above, I think, will be useful advice to follow for those who would try to cultivate them in the hills. I only give the names of a few good species. *O. Cirrhosum*, a fine white, spotted deep purplish-violet. *O Constrictum Sanderianum*, *O. Coronarium*, *O. Crispum*, *O. Jenningsianum*, *O. Hallii*, *O. Cristatum*, *O. Grande*, *O. Dormanianum*, *O. Leave*, *O. Warnerianum*, *O. Tripudians*, *O. Uro. Skinneri*, *O. Triumphans.*

Cypripediums.

This is one of the most important and interesting genera of all orchids, viewed botanically or horticulturally. Orchid lovers will find in Cypripediums an admirable plant to cultivate. They are not so expensive as to be out of the reach of most people, and they blossom at different seasons. Their cultivation is not so very difficult—silver sand, peat or a substitute for it, chopped sphagnum and leaf-mould, or brick in pieces, leaf-mould, sand and charcoal, which every one can obtain. Cypripediums require partial shade, such as a grass conservatory gives. *C. Barbatum*, solitary flowered, dorsal sepal large and broad, flecked purple on the lower half, the

upper half white ; petal ornamented with black hair from purplish warts on the upper edge. *C. Boxallii*, upper petals fresh light green with a narrow white border covered with brownish-black spots. Inferior sepal light green, shorter than the lip, with lines of small reddish-brown spots: petals light green, with a dark broad bluish-violet line. Lip a blunt conical sac, with two upright horns, and a channelled claw, greenish-yellow, with a dense row of cinnamon spots under the orifice of sac. Peduncle with dark blotches. *C. Concolor*, cream colored, finely speckled flowers borne in pairs on brown stem Leaves variegated. *C. Farieanum* is a species which would only do in the hills. *C. Hookeri*, something like *C. Concolor*, but more decided in color. *C. Insigne*, flowers solitary, 5 inches across in many cases. Dorsal sepal broad brownish-green, streaked reddish-green, lined faintly reddish-brown; upper part pure white. Lip large, dusky-yellow, and paler within. *C. Lawrenceanum*, upper sepal very broad, white with dark shining veins of purple. Lateral sepals small, greenish-white, with dark purple spots. Lip very large.

C. Selligerum, scapes bearing 2 or 3 flowers. Upper sepal white, veined blackish crimson ; inferior sepal small, whitish. Petals deflexed, with a twist 3 inches. Lip like *Barbatum*, but lighter in coloring. A hybrid between *C. Barbatum* and *C. Laevigatum*. *C. Niveum*, snowy white, freckled slightly cinnamon. *C. Stonei*, sepals large china-white, streaked red and purple, shaded ochrous-yellow ; petals very large, 4 to 5 inches, china-white. Lip dull purple, veined reddish, with curious slipper-shaped pouch. Scape generally three-flowered. *C. Spiceranum*, upper sepal white with line of purple in centre : lateral sepals greenish with centre line. Lip shining greenish. Top of columns white, spotted violet. *C. Venustum*, *C. Vernixium*, *C. Vescillarium*, *C. Villosum*, *C. Tessellatum*.

STANHOPEA.

Epiphytal orchids of America, with large flowers. Their flowers do not last long, but they are free blooming, and some

of them very handsome. Some of them are powerfully perfumed.

The plants should be grown in baskets, as the flowers are sometimes produced through the basket from beneath; these should therefore be made very open. Brick, charcoal and old leaf-mould should be used to grow them in, with a little chopped moss. *S. Bucephalus*, *S. Grandiflora*, *S. Insignis*, *S. Oculata*, *S. Tigrina*, *S. Wardii*, *S. Martiana*.

VANILLA.

Readily grown in pots with moss and potsherd well drained, with a branch for them to be tied on to. *V. Bicolor*, very fragrant, dull red. Lip cream. *V. Lutescens*, sepals and petals greenish-yellow. Lip bright yellow: flowers 6 inches across. *V. Phalænopsis*, bluish-white. Lip rosy-blush outside, inside tawny-orange. *V. Planifolia*, green or white within. Lip white. *V. Aromatica*, *V. Grandiflora*, *V. Alvida*, *V. Ovalifolia*, easily propagated by cutting taken off at a joint.

PHALÆNOPSIS.

These grow well in our grass conservatories, and are very desirable orchids. *P. Amabilis*, a lovely plant with flowers, sepals and petals white, rounded in shape. Lip streaked with purple lines. *P. Schilleriana*, rounded petals, narrow sepals, flowers fragrant, pinkish-mauve. Lip with yellow protuberances at the base. Frosted-looking roots. Leaves banded transversely and blotched white. Perhaps the best species in cultivation. *P. Grandiflora*, much like *P. Amabilis*. *P. Cornucervi*, sepals and petals yellow, tinged green, and barred and striped brown. Spike flattened and thickened near the flowers. *P. Manii* is allied to the last. Sepals and petals yellow, with cinnamon brown dots and blotches. Lip white and purplish. *P. Lowii*, sepals and petals whitish-rose. Lip rosy-purple. *P. Rosea*, flowers pinkish. Lip deep violet. Flowers nearly all the year. *P. Schumanii*, with leaves purple on the reverse, with enormous spikes of flower, and very

floriferous. *P. Esmeralda*, flowers rose-colored. *P. Sanderiana*, rosy large flowers. Lip white, with brown and purple stripes. *P. Speciosa*, white, spotted and striped rose-madder. Lip rosy-purple. *P. Luddemanniana*, flowers white, transversely barred brown at the points, the lower portion barred violet-purple. Lip richly marked violet. Remains flowering a long time. *P. Reichenbachiana*, large flowers in many flowered racemes, waxy, greenish-white with brownish markings. Side lobes of lip orange and white, centre lobe mauve-purple. *P. Violacea*, flowers closely set on spike, almost from its base, white, tinted violet-rose on the basal portions. Lip violet-crimson, golden-yellow callus, column violet-crimson. *P. Sumatrana*, flowers 3 inches, yellowish-white, barred reddish-brown. Lip white, spotted orange, streaked down centre violet. Spike about 6 inches, 5 to 10 flowered. *P. Sumatrana Sanguinea*, sepals dark-red with a very few green markings, (Borneo.) *P. Tetraspis* (four-horned), white. Lip ligulate, with a tooth at upper end and a conical callus in the middle. Lip with a cushion of hair at apex. *P. Valenlini*, purple petals and sepals, white at the base and having bands of purple. Lip mauve, white and yellow. *P. Veitchiana*, flowers like *P. Schilleriana*, but smaller, purplish. Lip purplish-white with purplish spots. Leaves tessellated slightly. *P. Luddemanniana Pulchra*, port-wine color: lower part of petals, sepals, lip and base of column shining amethyst blue. *P. Intermedia*, white, shaded rose. Lip a deeper hue. Varieties *P. Brymeriana* and *P. Portei*. The latter the largest flowers of the type and distinctly marked. *P. Boxallii*, sulphur, barred brown.

The leaves of these orchids should be kept particularly clean to ensure success in their cultivation. Most if not all Phalaenopsis are best grown on blocks or boards of wood, on to which they are wired with a little moss. They are generally of easy culture.

Writing of orchids, I am indebted to Geo. Nicholson, A.L.S., from whose work I have made abbreviated descriptions,

to admit of identification, to allow purchasers to know the plants they purchase. Some of the orchids have not been introduced to India.

OREODOXA.

Nat. ord., Palmeæ.

A small genus of five species of very ornamental palms. *O. Granatensis*, pinnate leaves with long narrow segments: an elegant species. *O. Oleracea* (Cabbage palm), leaves pinnate, drooping gracefully, arched. Stems swollen at the base. *O. Regina:* leaves pinnate, segments 6 inches to 12 inches long. *O. Sancona*, very handsome. Leaf stalks bronzy when young. Used much for table decoration on the Continent, like Cocos and Chamædoreas. *O. Ventricosa*, syn. *Gussia Ghiesbreghtii.*

ORNITHOGALUM.—*(Star of Bethlehem.)*

Nat. ord., Liliaceæ.

O. Arabicum.—Flowers large, white, with a black centre, having an aromatic odour: borne in racemes of 6 to 12 flowers. Scape 1 to 2 feet. Leaves 1 to 1½ feet long. This is a very pretty species and distinct. *O. Caudatum* bears whitish-green flowers of no merit, and is to be seen commonly in Calcutta. *O. Narboneusis*, milk white with a narrow green line down each segment of the perianth. Flowers very numerous, from 20 to 50 in a raceme, borne on an erect scape 1 to 1½ feet high, is another fine species. *O. Nutans*, *O. Pyramidate*, *O. Thyrosoides*. *O. Umbellatum* are all good and handsome species, which will do well in the hills, almost without care; and with a little care and shading in the plains also.

ORTHOSIPHON.

Nat. ord., Labiateæ.

Perennial herbs which are rather pretty.

O. Incurvus, flowers pale scarlet: corolla villous. (Firminger describes it as pink, which must be some other species.) *O. Stamineus*, pale lavender-blue, nearly an inch long. Propagated by cuttings or by seed.

OSBECKIA.

Nat. ord., Melstomaceæ.

These are handsome plants with leaves ribbed ("sub-coriaceous, sessile or petiolate, three to seven-nerved"). They should be cultivated like Melastoma, but do not seem to have met with much success in the plains. *O. Glanca*, syn. *O. Aspera*, red or purple calyx, somewhat hairy. Leaves elliptic-obtuse, narrowed at either end, hairy on both sides, 3 to 5 nerved. *O. Rostrata*, rosy pink flowers with long projecting anthers, which are curved, is a shrub. These are the best two species known.

OSMANTHUS.

Nat. ord., Olaceæ.

These plants require the same treatment as Olea. Being nearly hardy shrubs, they would do in the hills well, but would with difficulty be cultivated in the plains.

O. Aquifolium, flowers white, very fragrant; leaves prickly, toothed, shining. *O. Americanus*, purple.

OXALIS.—*(Small Bulbous Plant.)*

Nat. ord., Oxalidaceæ.

A very pretty genus of small flowering bulbs, which flower freely, and in profusion, in all parts of India, and do not deteriorate from climatic influences. They should be grown in a pretty rich light soil, composed of leaf-mould, loam and sand. The bulbs should be planted in pots or in rock work. They grow best with a moderate amount of shade, when their leaves, of a beautiful rich green, are seen in perfection. After flowering, like most bulbs, their leaves show signs of decay; they should then be suffered to die down by gradually withholding water, and their bulbs should be stored away in sand and kept dry, or they may remain in the pots they have occupied in a dry state. They should be divided again in the beginning of October, and repotted at about an inch and a half

to two inches apart. This is absolutely necessary, for they never flower well unless they are divided and placed in fresh compost, for they not only impoverish the soil, but get quite crowded with fresh bulbs, which spring up in numbers round the old ones. Many of the varieties, such as *O. Bowei*, *O. Florabunda*, *O. Deppei*, *O. Lanata*, *O. Versicolor*, *O. Crenula*, *O. Tetraphylla*, *O. Rosacea*, *O. Cuprea*, may be obtained in this country; while other varieties may be obtained from England.

O. Bowei: with handsome leaves, flowers large, deep rose or crimson, in large trusses.

O. Florabunda: rose.

O. Deppei: pale pink and sometimes rosy purple.

O. Lanata: flowers white, and leaves a pale bluish-green.

O. Versicolor: scarlet and white, or crimson and white.

O. Crenula: bright yellow flowers, and leaves speckled with black.

O. Tetraphyla: leaves four-lobed, and flowers purplish pink.

O. Rosea: deeper rose than *Bowei*, and with yellow centres to flowers, borne on a short foot-stalk.

O. Cuprea: golden yellow flowers, very pretty.

O. Grandiflora alba: white.

O. Speciosa: rosy purple, very showy.

O. Crenu flore-pleno: double, and very handsome yellow flowers. This is rather uncommon.

OXYANTHUS.—*(Syn. Megacarpa.)*

Nat. ord., Rubiaceæ.

These shrubs are highly ornamental, bearing white or yellow flowers, scented, elongated, and in racemes, many flowered, in axillary corymbs. They are quite as hardy in

India as Gardenia. *O. Hirsutus*, white flowers, star-shaped; limb 2 inches across and 6 inches long, fragrant. This bush is about 2 feet high, with broad leaves 5 inches long and smooth.

O. Tubiflorus is much like the above and *O. Versicolor* bears whitish, rose-colored and pink flowers of much the same size and shape as the above, but a little broader and not quite so long. The bush too is the same size.

PACHIRA. - *(Trees.)*

Nat. ord., Malvaceæ.

These are handsome trees with digitate leaves.

P. Cyathophora is cultivated in Calcutta, and has handsome foliage

P. Alba, P. Macrocurpa, P. Minor. The first (Alba) scented and flowing with honey: a very handsome tree. *A. Insignis* is considered a fine tree.

PÆONIA.—*(For Hill-stations only. Shrub.)*

Nat. ord., Ranunculaceæ.

Their flowers vary in color from pure white to bluish-salmon, and from rose to the most intense scarlet. The Chinese or tree varieties are hardy and early flowering. These, grown upon a lawn, or in a conspicuous part of the garden, are very handsome ornaments. They grow from 3 to 5 feet in height, forming shrubs which branch, and are from 10 to 18 feet in circumference, when grown in a rich soil and well cared for. Pæonias are exquisitely pretty, and their coloring is extremely rich; they are most profuse flowerers. In England they are grown in a mixture of peat and loam. The cultivation of these plants has been attended with no success, I believe, in India; but in climates like those of Simla, Mussoorie and Darjeeling, I would consider them bound to succeed, though they have failed at Ootacamund, according to Firminger. In Mussoorie I have had one in flower of the herbaceous or smaller

variety—the only one I have tried to grow. Their flowers come out sometimes in England so early in the spring that they are liable to injury from cold winds and frost; but in Simla, where the season is fully a month in advance of an English climate, there would be no danger of that.

PALISOTA.

Nat. ord., Commelinaceæ.

These are plants which are dwarf, some of them almost stemless, bearing their leaves chiefly on the tips of the stems. Their leaves are ornamental. They grow fairly well in grass conservatories in Bengal.

P. Barteri bears purplish flowers. Its leaves are radical 1 to 2 feet long, ovate-oblong, narrowed into petioles, and pointed at the apex into slender points, silky or hairy. Plant almost without a stem.

P. Bicolor: leaves narrowing at the base to a point and most abruptly towards the apex, 12 inches to 14 inches long by 5 inches broad. The upper surface stained with a disk of greenish-yellow. The edges of the leaf hairy, with brownish hairs. Petiole with a purplish band studded with brownish hair. *P. Bracteosa:* flowers white, leaves woolly.

PANAX.—*(Ornamental foliage.)*

Nat. ord., Araliaceæ.

These are plants with ornamental foliage, some of them not unlike some of the Aralias, and are propagated much in the same way. There are at present a large variety in this country: *Bunsei, Cochleanum, Cristatum, Dissectum, Elegans, Filicifolium, Fruiticosum, Gordani, Lanciniatum, Masangiana, Plumatum, Obtusum,* Sp. *Dissectum Rotundus, Serratifolia, Shepherdii* and *Veitchii Victoriæ.*

PANCRATIUM.—*(See Daffodil. Bulbous plant.)*

Nat. ord., Amaryllidaceæ.

These small bulbs require little care bestowed on them further than planting them in the open beds and borders

of the garden. Their flowers generally come out in the hot weather after a shower of rain, are fugitive and white. The bulbs are better by being left undisturbed where they are planted for years. *P. Biflorus*, with white, sweet-scented flowers. *P. Illyricum* is perhaps the best species. *P. Fragrans*, *P. Zeylanicum* and *P. Maritimum* are much alike, with bell-shaped flowers, slightly fragrant. Propagated by division.

PANDANUS.—*(Screw Pine.)*

(Keôra or Kayola of Natives.)

Nat. ord., Pandaneæ.

This is a shrub, a native of India and commonly seen in native gardens. Its leaves grow in whorls or are screw-like in arrangement, are long, strap-formed, and with spines along the edge. Aërial roots are sent down from the stem of *P. Odoratissimus*, which is the common species in India. The flowers are enclosed in whitish sheath-like leaves and are powerfully fragrant.

P. C. Variegatus, a pretty plant, with white edges to the leaves, a native of Java. Of dwarf growth. *P. Conoideus* grows to 14 feet or more, a native of New Caledonia. *P. Houlletii*, leaves 4 to 5 feet, a native of Singapore, is a rather elegant species. *P. Frucatus*, *P. Inermis*, *P. Vietchii.*

PANICUM.

Nat. ord., Gramineæ.

These are rather pretty grasses, of which probably *P. Variegatum* is the best. The blades are white-striped and pink-tinted with waved margins. *P. Capillare*, *P. Millaceum*, *P. Virgatum.*

PAPAVER.—*(Poppy. Annual and Perennial.)*

Nat. ord., Papaveraceæ.

These gorgeous flowers grow to perfection in this country, and do not, by any means, deteriorate. They are called

severally *Pæony-flowered*, *Ranunculus-flowered*, and *Carnation-flowered*. *P. Somniferum* have less divided leaves than *P. Rhœs*, which have hairy foot-stalks to distinguish them. The latter are called French poppies, and are of smaller growth: the flowers are of all conceivable shades of color, from yellow to white and pink to intense crimson and ash color and purple, but not blue. *P. Caucassicum* is a yellow variety, which is less common, also *P. Pilosum*, which has orange-colored flowers. The seed of poppies should be sown from September to November, and in hill-stations, if sown in autumn, they survive the winter and flower beautifully in spring, or sown in May they flower in summer, but are often destroyed by rain. They require a good rich light soil in the border where they are to remain. They will not stand transplanting, and must be sown thinly. If sown too thickly they must be thinned out, or the flowers will be worthlessly small. The best way of sowing the seed, which is fine, is by mixing it with sand to distribute it more evenly than it could otherwise be done. Seeds of poppies may be saved from year to year most advantageously. The plants have an unpleasant odour when handled. *Poppy Cardinale hybrids* are very fine, also the *Shirley Poppies* and *American Flag*.

PAPYRUS.—*(Egyptian Paper rush.)*

Nat. ord., Cyperaceæ.

Stems dark green and jointless, triangular, and bearing at the top a ray-like umbel of pendant leaves, common in Bengal. If well cultivated grows to a good height, but generally seen about 3 feet. Likes a marshy soil, and lots water. Propagated by division.

PARITUM.

Nat. ord., Malvaceæ.

A hybiscus-like tree with sulphur-yellow flowers, with puce eye of no great merit. Propagated by cuttings. *P. Tiliaceum.*

PARKINSONIA.—*(Jerusalem thorn.)*

Nat. ord., Leguminosæ.

P. Aculata: a tree with polished bi-pinnate leaflets; petioles linear, winged; flowers yellow, small, in racemes which are pendulous and sweet-scented. The plants are thorny and the stem polished green. It should be grown in well-drained soil, which should be porous. The plants are covered with straight thorns, which are solitary. Propagated by cuttings and by seed.

PARSONSIA.

Nat. ord., Apocynaceæ.

Scandent shrubs. *P. Corymbos*, leaves one to two inches long, bearing densely crowded corymbs of flowers, which are small and bright crimson. *P. Albaflora*, white flowers. Leaves with lobed margins. Scented flowers. *P. Velutiana.*

PARDANTHUS.—*(Leopard-flower. Rhizomous-plants.)*

Nat. ord., Iridaceæ.

P. Chinensis.—These are, by no means, uncommon in our Indian gardens in the plains with Iris-like leaves and rather pretty orange-colored flowers with scarlet spots on them, borne on tall foot-stalks from two to three feet high.

Propagated most easily by division. They grow without any particular care in almost any soil.

PASSIFLORA.—*(Passion flowers. Creeper.)*

Nat. ord., Passifloraceæ.

A most extensive and beautiful genus of climbing plants. They bear tendrils to support and assist them in climbing. Sir Joseph Paxton recommends them to be "pruned in the manner of a vine; that is, that the stems should be shortened to two or three eyes of the old wood;" he also states that they rarely bear fruit, unless "impregnated with the pollen of other species in preference to their own." They are all

propagated by cuttings, layerings, and grafting or inarching. Their flowers are interesting, beautiful, and curious. In hill-stations they will require to be protected in a glass conservatory during winter, as at Home (at least the more tender varieties). Adjoining is a list of names of *Passiflora* which have been imported and have flowered in India; and are the most select varieties.

P. Cærulea—Is the common variety, which throws up numerous suckers around it, and, notwithstanding its commonness, is one of the prettiest of the species. It is extremely hardy, and grows without any care in almost any soil to an extensive size. It flowers during the rains, with segments of the calyx and petals pale greenish-white, styles purple, rays of petals purple at the bottom, white in the middle, blue at their ends. Propagated by suckers.

P. Alata—Has fragrant flowers, calyx and petals crimson; rays variegated white, purple and crimson.

P. Atropurpurea.—Purplish flowers.

P. Cærulea racemosa.—Flowers very large and handsome, pale lilac with rays of pure white: a hybrid between the two whose names it bears.

P. Coccinea.—Scarlet.

P. Constance Elliott.—White. Very pretty.

P. Kermesina.—A slender-stemmed but extensive climber. Flowers carmine-crimson, and only appear in the shade, where it blossoms constantly through the hot and rainy seasons. This is considered one of the very finest of the Passifloraceæ common in Calcutta.

P. Quadrangularis.—Named after its peculiarly quadrangular stems. Flowers purplish or bluish, very fine. In the hills it is a rampant climber and flowers luxuriantly.

P. Holosericea.—Flowers sweet-scented, and borne in great profusion; of a tawny color and not very large. Leaves veined with dull red, and three-lobed.

P. Laurifolia.—An extensive creeper with glossy laurel-like leaves, and flowers blue, fragrant and large.

P. Racemosa.—A very choice variety, growing indifferently here, and has to be grafted on to a stronger species. Flowers scarlet or deep red.

P. Middletoniana.—A choice variety with red and green three-lobed leaves. Flowers exquisitely beautiful, of the brightest azure blue with white rings; sweet-scented.

P. Serratifolia.—This variety bears very handsome lavender-colored flowers.

P. Princeps.—A variety bearing very handsome scarlet flowers.

P. Fœtida (Love in a Mist).—A plant densely crowded with foliage and small white unpretending flowers; succeeded by fruit-like gooseberries covered with moss, very pretty.

P. Loudoni.—One of the choicest of its species: bearing brilliant crimson flowers of great beauty.

P. Incarnata.—This variety has exceedingly pretty pink flowers. Firminger says of it: "Formerly in the Calcutta Botanical Gardens, but since lost." It may be obtained from native dealers now in Calcutta.

P. Acerifolia.—A slender creeper with light blue flowers of exquisite beauty.

P. Heterophylla.—Also a slender creeper with exquisite flowers, yellow and crimson.

There are many other varieties which are less beautiful, while some have quite insignificant flowers.

Passiflora Edulis thrives and fruits well in the hills.

PAULLINIA.

Nat. ord., Sapindaceæ.

Climbing or twining shrubs. Their flowers are white or pale, in axillary racemes. After flowering they bear fruit of a pear shape, but three-sided, which have a three-celled capsule, with thin partitions.

They should be cultivated in a soil of loam and leaf-mould.

P. Sorbilis is the plant from which the Indians of the Amazon obtain their guarana, which enters so largely into their food.

P. Hooibrenkii and *P. Thalictrifolia* have been introduced to this country. They are propagated by cuttings.

P. Ocianica is a good species to cultivate. Generally speaking, they are not worth cultivating.

PAVETTA.—*(Shrub.)*

Nat. ord., Rubiaceæ.

This shrub is so much like the Ixora that it might be mistaken for it.

P. Richardiana has neat foliage and bears white flowers.

P. Tomentosa.—A coarse shrub with white fragrant flowers.

P. Indica.—With rather pleasing laurel-like foliage and dull white fragrant flowers.

P. Bourbonica.—Of recent introduction, has opposite leaves which are oblong-lanceolate spotted with white, the mid-rib being salmon red. This is a very desirable plant and most ornamental.

P. Diversifolia has pretty marbled leaves.

P. Caffra is grown more for its flowers, which are white borne in corymbs.

Propagated by cuttings put down in the rains.

PAVONIA.—*(Syn. Laurelia.)*

Nat. ord., Malvaceæ.

These thrive well in India. The species worth cultivating are *P. Odorata*, native of Ceylon. *P. Multiflora* and *P. Wiotii*, natives of Peru. Propagated by cuttings or seed. *P. Spinifex*, *P. Schrankii*.

PEDILANTHUS.

Nat. ord., Euphorbiaceæ.

P. Tithymaloides is known as Adjutants' hedge or Jew-bush, is a common weed in this country, sometimes used to form a hedge; bears small purplish-crimson flowers. Propagated by cuttings.

PELARGONIUM.—See *Geraniums*, page 311.

PELLIONIA.

Nat. ord., Urticaceæ.

These thrive well grown in grass conservatories, and are creeping perennial plants with ornamental leaves, which are radical, long-stalked, lanceolate or rather elliptic accuminate at both ends, with elevated veins, and the petioles sheathing at the base. *P. Daveauna*, olive green leaves with a central band of bright green. *P. d'Argentia*, silvery-leaved. *P. Pulchera*, leaves with the upper surface dull, blackish along the mid-rib and veins; underneath, the leaves are pale delicate purple. *P. Humilis* and *P. Teta*.

PENTALINON.—*(Savanna flower.)*

Nat. ord., Apocynaceæ.

P. Suberectum.—A climbing shrub bearing Allamanda-like flowers during the hot season. Leaves oval, about 1½ to 2 inches long. It requires a strong support, as it is a large growing climber.

PENTAPETES PHŒNICEA.—*(Annual.)*

Nat. ord., Sterculiaceæ.

This annual grows wild in this country, in paddy-fields, where it is semi-aquatic in nature, and exceedingly pretty, with compact heads of flowers. Sow the seeds in well moistened soil in July, August and September. Keep the plants well watered. In the hills sow Pentapetes in spring. The flowers are of a deep carmine color.

PENTAS.—*(A Shrub.)*

Nat. ord., Rubiaceæ.

P. Carnea.—Pretty herbaceous shrubs bearing Ixora-like heads of flowers of a lavender color nearly all the year. Propagated by seed or cuttings. *P. C. Kermesina*, with crimson flowers tinted violet at the throat, and *P. Parviflora*, flame-colored flowers, are less known.

PENTSTEMON.—*(Herbaceous plant: small shrub. Beard tongue.)*

Nat. ord., Scrophularineæ.

These are herbaceous perennial plants, and can be raised from seed sown in September and October in the plains, as well as in hill-stations, and in the latter localities in spring again. They may be also propagated from cuttings in sand, and by division. They flower during the hot and rainy season, and bear very pretty flowers of tubular form; chiefly scarlet, purple and blue in color. They do well in the hills and flower prettily if planted in open beds, but refuse to do so in pots. I have not seen them flower in the plains.

P. Grandiflorus: large lilac flowers, very handsome.

P. Lobbii: yellow.

P. Hartwegi: colors various.

P. Murrayanum: scarlet flowers.

P. Ovatum album: white flowers.

P. Cobœa: blue and yellow.

P. Acuminatus: bluish purple.

P. Barbatus Torregi: scarlet.

P. Coccineus: scarlet.

P. Laffrayanus: large bright blue flowers; a very handsome variety.

P. Digitalis: white, tinted blue.

PEPEROMIA.

Nat. ord., Piperaceæ.

Low growing, perennial, herbaceous, fleshy-leaved, creeping plants. Very interesting ornamental-leaved plants. They grow in almost any soil in this country and soon ramble to a good distance in their growth. A light rich soil suits them best. Their stems are hidden by foliage. Propagated by division.

P. Arifolia.
P. Maculosa.
P. Marmorata.
P. Nummulariæfolia.
P. Prostata.
P. Saundersii.
P. Verschaffeltii.
P. Argyrea.
P. Clusiæfolia.

PERESKIA.—*(Barbados gooseberry.)*

Nat. ord., Cacteæ.

P. Bleo.—A large spreading bush with long needle-like thorns, five or six in a bunch, all over the stems. Leaves oblong-accuminated, flowers pink.

P. Aculeata (Barbados gooseberry).—A smaller plant and the flowers white. They grow in any good soil. Propagated by cuttings. *P. Grandifolia*, large-leaved, flowers white.

PERGULARIA-ODORATISSIMA.—*(Primrose or Cowslip creeper.)*

Nat. ord., Asclepiadeæ.

A climber with slender stems, but covering a good extent of trellis-work, with heart-shaped pointed leaves. It bears flowers of a dull greenish-yellow color of small size in clusters of most delightful fragrance. The plant itself is not attractive, and the flowers are hidden among the leaves; but

the fragrance of the flowers will recommend the cultivation of it. Propagated easily by layerings, or from seed, which it bears during the cold seasons. It grows well in any ordinarily good garden soil.

PERILLA NANKINENSIS.—*(Annual. Ornamental foliage.)*

Nat. ord., Verbenaceæ.

This plant is much used for ribbon borders, having leaves of a purplish color, the flowers of the plant being quite insignificant. Sow the seeds in the plains in October, or February and March, and during the latter month in hill-stations. The seed comes up at different intervals and takes a long time to have all germinated.

PERIPLOCA.

Nat. ord., Asclipiadeæ.

A creeper bearing the name of *P. Esculenta*, with white flowers. *P. Scutellaroides*, flowers scarlet, ½ to ¾ inches long, in racemes 6 to 12 inches long. Rather pretty plants. Grow readily in a good light soil. Propagated by layers.

PERISTROPHE.

Nat. ord., Acanthaceæ.

P. Tinctoria.—A pretty small plant bearing pink flowers in the cold season.

P. Augustifolia-aureo-variegata —A creeper with pretty variegated leaves. Known by natives as "*Vetarang.*"

P. Speciosa.—Like Tinctoria, the tube of the flower being twisted. Propagated by cuttings in the rains.

PETALIDIUM.

Nat. ord., Acanthaceæ.

The leaves of these plants are ovate, slightly toothed. There are only three species known, of which *P. Barlerioides* is the best. It bears quite a profusion of white thimble-formed flowers, which are rather pretty. Propagated by cuttings.

PETRÆA.—*(Creeper.)*

Nat. ord., Verbenaceæ.

These are rather stiff creepers; when in flower they are really most lovely objects: nothing of floral beauty can be finer than they are when covered with their azure blue clusters of star-formed blossoms, in perfect wreaths almost draping the whole plant in color, in October and again in February and March. There are two varieties, *Petræa Stapelia* and *Petræa Erecta*, both so much alike as hardly to be distinguished from one another. *P. Erecta* has perhaps shorter bracts, smaller leaves and the plumes of blossoms are not so large, while the plant is of more erect growth. The leaves of both varieties are oval, rigid, and rough, or like a fine file to the touch. Propagated by layering or from suckers.

PETUNIA.—*(Annual.)*

Nat. ord., Solanaceæ.

The brilliancy of these flowers, their duration, their great beauty, and their capability of withstanding variations of climate, commend them to special attention. Petunias, like many of our choice annuals, have been much improved lately, the result being simply wonderful; for instance, *Petunia Hybrida, Maxima, Fimbriata, Flore Pleno; Petunia the Californian Giants*, both single and double, have flowers fringed, of great size, and of the greatest perfection; also *Petunia Superbissimus, Intus Aurea* or the new yellow-throated Petunia, which, after several years of careful selection, has at last been fixed, constitutes a class of great beauty. The flowers are very large, with a deep yellow throat generally veined. The price of their seeds are naturally dear, as some of these varieties produce but little seed. They succeed well in a light rich soil of leaf-mould, turfy loam and old manure. In growing Petunias it is best to adhere to some distinct varieties. Plants of all choice kinds

may be placed in pots and kept out of heavy rain, which batters and kills them: they can then be propagated from cuttings in water, or in sand and water, or sand alone under glass; the latter being the best method. Seed should be sown in hill-stations in February, March and April to flower in autumn or the following spring according to elevation, or in October to flower in spring, and in the plains from September to November. It is best to obtain the best and freshest seed procurable in Europe. There are many beautiful double kinds. Petunias may be grown in pots, baskets, or in the border. One thing to be borne in mind is that they should not be allowed to stand in the beds they are sown in too long, as they are much injured thus, and their flowers never turn out so fine. Plant out in pots or beds as soon as the young seedlings can be handled or are strong enough, and shelter from the sun for a few days.

PHÆDRANASSA.—*(Queen Lily.)*

Nat. ord., Amaryllideæ.

A genus of dwarf bulbous plants which have showy flowers, being borne on a scape in umbels, reflexed, with their perianth greenish red or two colored. *P. Gloriosa*, vermilion and green. *P. Cremioli*, bright red, tipped green. *P. Eurosioides*, red, tube green. *P. Lehmanni*, scarlet. *P. Viridiflora*, greenish-yellow. Cultivated best in a light soil. Propagated by division.

PHALANGIAM.—*(Syn. Anthericum.)*

Nat. ord., Liliaceæ.

Dwarf bulbous plants with linear leaves, well suited for pot culture. Cultivate in a light soil of loam, coarse sand and leaf-mould, and propagate by division. *P. Liliago* (St. Bernard's Lily), white. *P. Liliastrum* (St. Bruno's Lily), flowers two inches long, scented, white. *P. Ramosum*, like the last, but smaller, and stems much branched. *P. Argento-linearis*, leaves striped white.

PHASEOLUS.—*(Climbers.)*

Nat. ord., Leguminosæ.

P. Caraculla (Greek creeper or Snail flower).—This is a peculiar flower, purplish-rosy-white and yellow mixed, having some resemblance to a snail. Leaves ovate romboid accuminated. The flowers are sweetly scented. Raised from seed during the rains. They frequently die off during the cold season, so a little seed should be kept. The plants should be cut in at the approach of the cold season in November or December. Should be grown in a large pot and well drained. *P. Lobatus*, yellow, many flowered. *P. Semi-erectus*, greenish, tinged purple. Leaves trilobed.

PHILADELPHUS.—*(Syringa, mock orange.)*

Nat. ord., Saxifragaceæ.

P. Coranarus can only be cultivated in the hills. Its flowers are white, with a strong orange scent; leaves ovate-accuminate, which, when crushed, have the odour and taste of cucumber.

P. Hirstus, white.

P. Grandiflorus, sweet-scented, white.

They should be well cut in after flowering, as their flowers are borne on the last year's wood. They can thus be kept within bounds. Propagated by cuttings or layers.

PHILAGERIA.

Nat. ord., Liliaceæ.

P. Veitchii.—A monotypic hybrid raised by Messrs. Veitch & Co. between *Philesia buxifolia* and *Lapageria alba*. *P. Veitchii*, flowers rose-purple, boat-shaped, fleshy petals. Sepals rosy, three in number. Easily cultivated in a grass conservatory in the plains. Propagated by cuttings.

PHILADENDRON.

Nat. ord., Aroideæ.

Easily grown in grass houses. They are mostly climbing plants that would creep on a wall or pillar. Easily propagated

by division of the stems, which take root as they creep along the ground. Cultivated in the same way as Anthuriums. *P. Cardevi** syn. *P. Verrucosum*, satiny green with metallic shades, under-surface banded maroon. *P. Erubescens*, leaves with purple sheaths, flowers blackish-purple. *P. Fragrantissimum*,* highly-scented flower, cream color with red base. Leaves sagittate. *P. Mamei*, leaves cordate, handsomely variegated white. *P. Pinnatifidum-rubro-punctatum*, flowers white, dotted blood-red. *P. Nobile*,* *P. Wallisii*,* *P. Sanguineum*, *P. Selloum*,* leaves much pinnatifid. *P. Lindenianum*, *P. Pertusum*, *P. Radialum*.

PHLOGACANTHUS.

Nat. ord., Acanthaceæ.

Of these plants, which are trees or shrubs, the only one or two species that are worth cultivating are *P. Asperulus*, with purplish-red flowers, a native of the Kassia hills, and *P. Thyrsiflorus;* the latter with polished green leaves, tawny brown flowers. Propagated by cuttings, which are best taken during the rains.

PHLOMIS.

Nat. ord., Labiatæ.

Coarse-looking herbs or shrubs. *P. Leonurus* (Jerusalem sage) bears gaudy orange flowers. *P. Cashmeriana*, pale lilac, two feet. *P. Ferruginea*, yellow hairy flowers, leaves hairy below. Propagated by cuttings.

PHLOX.—*(Annual and Perennial.)*

Nat. ord., Polemoniaceæ.

This is a truly magnificent genus of plants, both annual and perennial, quite unrivalled for brilliancy and richness of color. They flower profusely, and are of long duration. The varieties called *P. Drummondi* are splendid bedding plants; no other bedding plants sown in India equal them, and they are also pretty pot plants. The French varieties, called *P. Decussata*, which are perennial, are handsome in

mixed borders. All these plants grow in a rich light soil. They stand the heat of the plains well, and seed abundantly. The seed may be gathered from the annual or *P. Drummondi* varieties, as imported seed may fail, and the flowers do not degenerate much, if at all, from acclimatized seed. *P. Drummondi*, scarlet; *P. D. Black Warrior*, crimson; *P. D. White; P. Oculata*, white with crimson eye; *P. D. Isabella*, yellow, and so on. Any good seedsman will supply many varieties, all of which are good and beautiful. Sow the seeds in the plains from September to November for succession. In hill-stations sow in spring to flower in autumn or in October, and protect in winter to flower in spring.

Phlox Decussata (Perennial Phlox) demands special attention in the hills, as it is a perennial of great beauty, and being hardy, forms fine bushes, bearing a large quantity of flowers, which are most useful decoratively and for pot plants in the verandah, as well as for cut flowers. A good rich soil suits them. Propagate them from seed or cuttings. There is a very large variety of them, all very pretty.

PHŒNIX.—*(Date palms.)*

Nat. ord., Palmæ.

These are grown easily from seed. *P. Dactylifera*, the date palm. *P. Sylvestris*, sugar palm. *P. Aucalis, P. Farinifera, P. Ouseleyana, P. Paludosa. P. Rupicola* is the common date palm of this country. These plants are handsome for decoration in pots.

PHORUM.—*(Flax Lily.)*

Nat. ord., Liliaceæ.

Natives of New-Zealand, with fleshy, grass-like, long leaves, and flowers of a dull red or yellow, in large panicles on a scape from 5 to 15 feet high. *P. Cookianum*, yellow flowers. *P. C. Variegatum*, leaves beautifully banded at the margin with white.

P. Tenax, yellow and red flowers, and several varieties of *Tenax* with variegated leaves.

PHOTINIA,

Nat. ord., Rosaceæ.

Trees with handsome leaves, flowers generally white. They grow in a light rich soil.

After the flowers berries are produced. Propagated by cuttings or seed.

P. Japonica is the loquat, but *P. Dubia* is a native of Bengal, bearing sweetly-scented flowers in January, which are white. Propagated by seed.

PHYLLANTHUS.

Nat. ord., Euphorbiaceæ.

They grow easily in any ordinary garden soil. Their flowers are insignificant and of no merit, but their foliage is handsome and is borne in long rows of leaves which are opposite to each other, so as to give the appearance of pinnate leaves. *P. Augustifolium*, *P. Autropurpureus*, *P. Nivosus*, *P. Chantrieri*, *P. Roseo-pictus*, *P. Salviæfolius*, *P. Sremannianus.*

PHYLLARTHRON.

Nat. ord., Bignoniaceæ.

P. Bojeriana.—A rather peculiar small shrub, bearing pale pink flowers, funnel-shaped corolla, 1¼ inches long; lobes obtuse and broad. Branches three sides and true leaves absent, but rachis developed into a leaf-like-form, which is narrowed in the middle.

P. Comorense.—This is a shrub with long narrow leaves, the flowers being pink, borne in racemes. It bears a long narrow fruit of the shape of a finger, used for making jellies in the Mauritius.

It thrives well in this country in a light sandy soil mixed with leaf-mould and charcoal. Propagated by cuttings.

PHYLLOCACTUS.

Nat. ord., Cacteæ.

So named with reference to its leaf-like stems (from *phyllon*, a leaf). They are handsome plants. *P. Ackermanni*, rich crimson shining petals, outer ones being lighter in color.

P. Anguliger, petals white, sepals orange or yellow, sweet-scented. Stems deeply angled. *P. Crenatus*, centre petals creamy-white, outer narrow and orange-colored. Stems flat. Variety of this, a hybrid, *Cereus crenatus*, bears handsome scarlet flowers. *P. Latifolius*, creamy-white petals and reddish sepals. *P. Phyllanthus*, large creamy-white. *P. Phyllanthoides*, rose and white, in irregular streaks: flowers small. *P. Jenkinsoni*, crimson.

PHYLLOTAENIUM.

Nat. ord., Araceæ.

P. Lindeni.—An arad, with sagittate leaves, which are a dark green, the mid-rib and veins being ivory-white. Cultivation the same as for Caladiums. Propagated by division during the growing season.

PHYSALIS.—*(Chinese lantern plant.)*

Nat. ord., Solanaceæ.

P. Franchetti or the Chinese lantern plant is much grown in England for its handsome large sized fruit, which are larger than *P. Alkekengi* or Winter Cherry. It does well planted in any soil. These are not unlike *P. Peruvianus Edulis* or Cape Gooseberry, or native name "*Teparee*," but considerably larger and brighter in color, being crimson or blood-color. Propagated from suckers or seed. Hardy plants.

PILOCEREUS.

Nat. ord., Cacteæ.

A very handsome Cactus, remarkable for the woolly head at the summit of the stem, now classed by Bentham and

Hooker under Cereus. *P. Dautwitzii*, *P. Houlletii*, *P. Senilis* (or old man Cactus).

PINANGA.

Nat. ord., Palmæ.

These are probably our handsomest palms. They are propagated by seed. *P. Maculata*, leaves spotted on the upper side dark green. *P. Spectabilis*, *P. Veitchii*, *P. Sanderiana*, *P. Putula*, *P. Malaiana.*

PINUS.

Nat. ord., Coniferæ.

P. Longifolia (Chir) is perhaps the only one of this species that grows well in the plains. There are many other species that grow in the hills, but they take up too much room in gardens to be grown there, where space is limited. *P. Excelsa* (Bhotan pine), *P. Gerardiana.*

PIPER —*(Creepers.)*

Nat. ord., Piperaceæ.

To this genus belongs about 600 species, and *P. Betel* or "*paun*" of the natives. Among them are found some handsome leaved creeping plants, not all of them generally known to us in our Indian gardens. They grow best in a partially shaded position.

It is, however, in economic value that they are of the greatest importance. The pepper of commerce, *P. Nigrum*, is imported in large quantities. *P. Ornatum* and *P. Magnificum* are handsome species with variegated foliage. *P. Decurrens* has metallic colored leaves. The stems of the plants are mottled white and with black lines. *P. Excelsum-aureum-pictum* has a large creamy blotch on its leaves and is a small bush or tree. *P. Futokadsura* bears red fruit. *P. Porphyrophyllum* has bronzy-green leaves, beautifully spotted pink along the course of the veins. These plants require a rich, light, loamy soil. Propagated by cutting inserted in sand.

PITCAIRNIA.—*(Sedge-like plant. Pot plant.)*

Nat. ord., Bromeliaceæ.

These plants have sedge-like leaves, and bear very handsome flowers of a brilliant crimson color. They should be grown in a light sandy soil mixed with drainage materials and cocoanut fibre. Their flowers are produced during the hot and rainy seasons. *P. Olfercii, P Bromliæfolia, P. Punicea, P. Integrifolia, P. Allensteini, P. Frusticosa,* and *P. Latifolia* are all varieties of this plant. Propagated by division. These plants should not be heavily watered.

PITTOSPORUM.—*(Shrub.)*

Nat. ord., Pittosporaceæ.

P. Tobira is an exceedingly handsome shrub about four feet in height. Its chief beauty lies in its foliage, which is of a shining green, each leaf being about three inches long, obovate and smooth-edged. It seldom flowers in this country, but when it does it bears white fragrant flowers in terminal clusters. *P. Tobira variegatum* has variegated leaves green and white. *P. Verticillatum* is much like the last, and bears white terminal clusters of flowers.

PLATYSTEMON.—*(Annual.)*

Nat. ord., Papaveraceæ.

P Calinfornicum.—Very much like *Eschschotzia* or Californian poppy. Sow in the plains in October and November, and in the hills in March and April, and do not transplant, but sow where the plants have to remain, and then thin the plants to 4 or 5 inches apart. The flowers are yellow.

PLEROMA.—*(Pot plant.)*

Nat. ord., Melastomaceæ.

P. Lineatum.—A small plant best grown in pots, bearing pale purple flowers and with rich green leaves. *P. Benthamanum* bears pretty dark purple flowers with white centres. *P. Elegans,* rich blue flowers. They should be allowed some

resting period in the cold weather and should be watered sparingly.

P. Trinervia.—A very choice pot plant of small growth with pretty rich green foliage, and bearing pretty pale purple flowers during the hot months. Propagated by cuttings under glass.

PLUMBAGO.—*(Shrub.)*

Nat. ord., Plumbaginaceæ.

Plumbago Capensis.—A prostrate shrub of about three feet in height, with foliage in a succession of whorls up the stem. Leaves lanceolate and unequal in size, from half an inch to two inches long. Bears, almost at all seasons, but especially during the hot and rainy seasons, pale azure blue flowers, in form and arrangement like Phlox blooms. It will be benefited by pruning during the cold season. A very ornamental and common plant in Indian gardens. Propagated by cuttings or division.

P. Larpentæ.—Much like the last mentioned in appearance, but has flowers larger and of a deeper blue.

P. Rosea.—A shrub much the same size as *P. Capensis*, and flowers of a pale pinkish scarlet, like those of the *Scarlet Ixora.* A very beautiful shrub. It requires shade and moisture. Propagated by cuttings taken during the rains.

P. Zeylanica.—Not a very pleasing shrub, with white flowers. Bears seed in abundance.

PLUMIERIA.—*(Spanish Jasmine. A small tree.)*

Nat. ord., Apocynaceæ.

P. Acutifolia or *P. Acuminata*, Spanish Jasmine, is a small tree about ten feet high. Leaves lanceolate and smooth, nine inches long and two-and-a-half inches wide. Bears beautiful corymbs of pure white fragrant flowers during the hot season and rains. The centres of the flowers are yellow and of a delicate waxy appearance. Propagated easily by cuttings.

P. Alba, with pure white flowers, and foliage denser and darker in color. In other respects much like *C. Acuminata*.

P. Tricolor: white, yellow and crimson.

P. Bicolor: flowers white and yellow.

P. Rubra Frangipani: plant bears red flowers in crowded fascicles.

PODOCARPUS.

Nat. ord., Coniferæ.

These are evergreen trees or shrubs, which are ornamental, planted on a lawn, for their foliage, which is handsome. *P. Andina*, *P. Chineusis*, *P. Elongatus*, *P. Latifolia*, *P. Vitiensis.*

POGOSETEMON.

Nat. ord., Labiatæ.

P. Patchouli (native pucha-pat) is a coarse, uninteresting-looking plant, from which the scent of that name is obtained (Patchouly, which is the correct way to write it). The leaves, dried and put among clothes, give them the peculiar fragrance common to the plant.

POINCIANA.—*(Shrub and tree.)*

Nat. ord., Leguminosæ.

C. Pulcherrima.—A thorny shrub with bi-pinnate foliage. Leaflets oblong. Makes a good fence, being of rapid growth. Flowers borne in immense erect tuft-like racemes of yellow blossom. It should be cut in, in the cold season, to prevent straggling growth. A most handsome shrub, raised easily from seed. It may also be propagated by cuttings. There are two varieties, one bearing yellow and the other scarlet flowers. The plants do not stand a cold climate well.

P. Gilliesii.—A pretty shrub with bi-pinnate foliage of minute leaflets which give the plant a nice light appearance. This plant grows to about three or four feet in height, and bears panicles of large flowers, with pale yellow petals and

long rose or crimson stamens, during the hot and rainy seasons. It soon gets unsightly, and should be renewed from seed every second year at the least.

P. Regia (Flamboyant tree).—This is really a lovely tree with light foliage: when in flower, a mass of red and orange color. It grows rapidly, but is liable to be broken by the wind. The flowers are succeeded by large beans which contain seed, from which it may be propagated.

POINSETTIA.—*(Shrub. Ornamental foliage.)*

Nat. ord., Euphorbiaceæ.

P. Pulcherrima.—This is a large shrub growing to eight or ten feet high, with elliptical green leaves. In the cold season, its branches, which droop and are in the form of rods, have, at their ends, insignificant flowers surrounded by rays of large elliptical crimson-scarlet bracteal leaves of the most gorgeous appearance: a truly lovely object. It grows in perfection in Bengal and as far up as Patna, but further up-country the cold season is too severe for it, and it requires to be sheltered. By pruning, it assumes a more upright growth, which robs it of its graceful drooping habit. It should, therefore, never be pruned, but be renewed every few years. It strikes most readily from cuttings, especially during the rains. *P. Plenissima*, leaves borne in profusion, but like the above.

P. Pulcherrima-albida.—A variety of the last, with rays of white bracteal leaves instead of crimson-scarlet. Also a handsome variety, but not equal to the last in splendour. The foliage, as well as the bracteal leaves, are smaller, but of the same shape as the last. This is also propagated from cuttings.

POIVREA.—*(Creeper.)*

Nat. ord., Combretaceæ.

Poivrea Coccinea and *Poivrea Coccinea Grandiflora.*—These are both very choice plants. The flowers differ only

in being a little larger in one variety than in the other, their color being a very pretty scarlet-crimson, borne in compact brush-like bunches in great profusion; a most beautiful object and one of the finest creepers grown in India, in which it abounds and excels. The foliage of both varieties is the same in form, of a lanceolate glossy bright green; those of *P. C. Grandiflora* being slightly the larger of the two.

P. Roxburghii.—A more extensive climber than the two last, with dingy white flowers—not attractive. All of these plants are propagated with difficulty. Graft or inarch on *Banisteria*, or take cuttings in sand under glass, which is the best method. Layerings do not root freely.

POLIANTHES TUBEROSA.—*(Tuberose. Bulbous plant. Sweet-scented.)*

Nat. ord., Amaryllidaceæ.

This is one of the commonest of our garden plants, propagated by division. It grows without any particular care in the plains, and is a most delightful addition to gardens there, with its very fragrant white tube-like flowers borne on the top of a spike from three to four or five feet in height. At high elevations in the hills it should be cultivated with much manure at its roots, or bottom heat should be applied to make it flower.

The foliage of the plant is of a light green,—thick, strap-leaved, about a quarter of an inch in breadth, like some coarse thatching grass. The flowering spikes should be cut down after the flowers fade. There are very handsome double-flowering varieties, the Pearl and African Double, which bear splendid clusters of flowers not so fragrant as the single variety. The stems of these varieties ought to be supported with stakes, or they are sure to fall over with the weight of the flowers. Propagated by division.

POLYANTHUS.—*(Florists' flower. Perennial shrub for the North-West Provinces and Hill-stations.)*

Nat. ord., Primulaceæ.

The single varieties of Polyanthus are only looked upon as florists' varieties. They are indefinitely increased by careful selection of seed. The seed should be procured from Europe by letter post as soon as it is gathered. It should then be sown in pans or boxes well-drained and filled with a light but rich mould. The seed may be lightly covered,—indeed it may almost lie on the surface, and the pots or boxes covered with glass and very sparingly watered. No artificial heat is required. Late in the year is the best time for sowing—from October to December in the North-West, and October to November in hill-stations. By this treatment, the seed will rapidly germinate, and will require to be kept shaded from the sun afterwards, and from the heavy rain. When the plants are strong enough, they should be picked out and planted in a shady situation in beds, in which they can be protected. The compost should consist chiefly of loam, sand, and leaf-mould in equal parts, and a small quantity of old cow-dung should be added to it. Sow in boxes or pots. The plants will begin to grow in spring, and will require to be slightly earthed up; and they will flower beautifully if the beds are kept clean. In the hot season, they will require to be shaded from the sun again, and when the plants grow, they may be divided in autumn and transplanted into pots, selecting the best varieties, using the same compost as that used for the beds. Gather up all dried foliage and stake the spikes of bloom. When the plants show signs of bloom, surface-dress the pots, removing some of the old soil, and replace it with fresh and richer compost without disturbing the roots. As the flowers fade, the plants should be taken up, divided, and planted out in beds in a shady situation, and they may be re-potted again the following autumn as before. Only the most select and

best market flowers should be chosen for seed. These plants are rarely seen in Bengal, and do not thrive there unless with the greatest care, and even then may cause disappointment. Frequent watering, with weak liquid manure of sheep's or goat's dung, is beneficial to the Polyanthus when it is in bud and bloom. In the North-West Provinces and the hills, I have had the most choice varieties of Polyanthus growing from year to year.

POLYGONATUM.—*(Solomon's seal.)*

Nat. ord., Liliaceæ.

These thrive best in the hills, where they may be grown in open beds or pots, being small, rather pretty plants. *P. Biflorum. P. Multiflorum* is the true Solomon's Seal or David's Harp, the flowers being small, white, succeeded by bluish-black berries. Not very attractive.

POLYGONUM.

Nat. ord., Poligoneæ.

P. Adenophyllum.—This is easily grown in the open border, and is pretty for the autumnal tints its leaves acquire on the approach of the hot weather; also for its small white flowers, borne in the cold season. The best species of Polygonum are *P. Affine*, a native of Nepaul, with rosy-red flowers: *P. Amplexicaule*, a Himalayan species, with bright rose-red or white flowered species: *P. Cuspidatum*, a very graceful species from Japan, with quantities of small white flowers. Propagated by division of the roots.

PORANA.—*(The Bride Creeper and Snow Creeper.)*

Nat. ord., Convolvulaceæ.

P. Volubilis and *P. Paniculata* are much like each other, but the leaves of the latter are hoary beneath, and the plant has altogether a more hoary appearance. The flowers of both species are white, but those of *Paniculata* have a slight odour of lavender. Flowers in panicles of the

largest size on *Paniculata*. Both species are very handsome when in flower, but *P. Racemosa*, known in England as the "Snow-creeper," is even more beautiful. All the species are natives of India. The flowers are individually minute, but are borne in large racemes most profusely. Propagated by layers and cuttings. *P. Racemosa* may be propagated by seed. These plants are to be found wild on the low range of hills all along from Monghyr and Rajmehal. They grow in any soil and require little care.

PORTLANDIA.—*(Shrub. White Horse of Jamaica.)*
Nat. ord., Rubiaceæ.

P. Grandiflora.—These are exceedingly choice shrubs of exquisite beauty. The foliage is very handsome, of a rich glossy green, which contrasts well with the flowers, which are about five inches long, and pure white, like those of the White Lily, and exquisitely fragrant, like that flower, especially at night. *P. Coccinea*, scarlet, with yellow anthers. *P. Platantha*, white flowers, one inch long, four inches across. Their leaves may be described as opposite, thick, coriaceous, linear-oblong, about three inches long by two broad, pointed. They grow in any good soil, but require protection from cold even in the plains. Propagated by cuttings in the rains.

PORTULACA.—*(Dwarf Annual. Prostrate plant.)*
Nat. ord., Portulaceæ.

No flowers can be more brilliant and various in their shades of color. They are indeed exquisite, though their beauty is of short duration, as the flowers close in the after-part of the day. Though they are called annuals, yet they last from year to year if sheltered from heavy rain. I can testify to this myself, having had plants last over from one year to another. The seeds of Portulaca may be sown at almost any time of the year, from February to November. They may be transplanted or not. The seed is very fine and should be mixed with sand to distribute it evenly in

the beds, and should be very lightly covered. In gathering seeds, look for them daily, as the cap falls off, and the seed, which is then exposed, may otherwise be lost. Portulaca is an exceedingly hardy plant, and if sown in pans well-drained and filled with a light soil, will withstand the greatest heat, if not over-watered. In watering seed pans, they should not be watered overhead, but placed in other pans of water till the soil is moist. When the plants are strong they may be watered overhead. Little bits of the branches of Portulaca, taken off the old plants and stuck into a sandy loam in pots, soon strike without difficulty, and form fresh plants. The plants re-sow themselves, and if a pot in which they have flowered be simply dusted over with a little dry earth, and placed away, in a dry corner, and watered again when the plants are wanted, they will germinate thickly, and can be transplanted without danger. They are self-colored, white, crimson, scarlet, golden, yellow, straw-color, pink, purple, and so on ; or hybrid as below.

P. Caryophylloides Aurea.—Crimson striped with gold (a choice variety), or white striped with rose, pink, crimson or any of the colors ; or any one color striped with a darker shade of the same color, or any other of the colors. There are double varieties of the Portulaca like little roses, of all shades : these are called *Portulaca Flore-pleno.* They require exactly the same treatment, and are very choice plants.

Portulaca meridiana, a perennial plant. A small pot plant with nothing to recommend it beyond its mossy foliage. Flowers insignificant.

Portulaca Afra, also a perennial like the last-mentioned. A pretty pot plant, but does not flower here.

POSOQUERIA.

Nat. ord., Rubiaceæ.

Lovely American plants which bear sweetly-scented flowers. Leaves opposite, on short petioles. They should be cultivated just like *Gardenias.*

P. Formosa, white, very long, sweet-scented. *P. Fragrantissima*, slender white flowers, very fragrant. *P. Longiflora*, white tube 6 inches long. *P. Mutiflora*, one of the best, white, fragrant.

POTENTILLA.—*(Small shrub.)*

Nat. ord., Rosaceæ.

These are pretty little plants growing to about one-and-a-half feet in height. They have flowers of various colors, and are easily raised from seed sown from September to February. *P. Maculata*, *P. Sulphurea*, and *P. MacNabiana*. They are not much cultivated in India, as they do not flower in mass or freely.

POTHOS.—*(Aracea.)*

Nat. ord., Aroideæ.

They should be cultivated like *Anthuriums*. They propagate themselves, for where their stems meet the soil they take root. Most of them are extensive climbers of parasitic or epiphytical growth. *P. Argrea*, plant dwarf, with silvery leaves. *P. Aureus*, a rampant climber. Leaves heart-shaped, deep green, blotched gold in fantastic shapes. *P. Flexuosus*, leaves shining pale green, 4 to 6 inches long. *P. Celocaulis* is probably one of the handsomest. Leaves dark green above, pale below, with a short clasping sheath, broadly elliptic, obtuse at apex. The under-portion of the leaf is minutely crystalline. It lies perfectly flat on the surface over which it climbs. Good for covering trunks of trees, walls, etc. *P. Gigantea*, best grown on lofty trees, where it hangs like a drapery. *P. Scandens*, leaves 2 to 3 inches long, lanceolate, acute, obtuse at base, petioles winged, rather a large climber, sometimes known as *P. Seemannii*. These are all handsome plants.

PRIMULA.—*(Primrose.)*

(Primula Sinensis Fimbriata and *Polyanthus.)*

Nat. ord., Primulaceæ.

This genus is an extensive one, including some of the choicest and most popular florists' flowers: *viz.*, the *Auricula*, the *Polyanthus* and the *Primrose*, of which latter class we will treat, and I call the reader's attention to the greenhouse varieties of Primula, so useful for winter decoration, as well as *Primula Japonica* and *Polyanthus.* The remarks equally apply to all these and other Primulas.

The public are greatly indebted to Mr. Williams, who has devoted much care to these beautiful plants. His directions, which may be fully relied on, are as follows, and notwithstanding difference in climate, cannot be too closely followed:—"Sow in March, April, May, June and July, or in "November and December (with great care, for, although "so easily raised in the hands of some, it is nevertheless a "great difficulty to others, who in many instances too hastily "condemn the quality of the seed), in pots filled to within "half an inch of the top with sifted leaf-mould, or, what is "better, with thoroughly-rotten manure which has been ex-"posed to all weathers for a year or two. Leave the surface "rather rough, and sprinkle the seed thinly upon it, not cover-"ing with soil." These instructions are in some respects different from those given by Pogson, and I think them decidedly better; but the sowing of the seed might be confined to May, June and July or August. I cannot agree with Pogson s views of watering the pans, then sowing the seed and again covering it, and watering it again after pressing down the soil: all this is decidedly injurious in my opinion. Mr. Williams goes on to say: "*Tie a piece of paper over "the top of pot and leave it in a warm house or hot-bed.* "When the seed becomes dry, *water the paper only:* the "seed will then germinate in two or three weeks." The italics are mine, to show the excellence of his arrangements.

After this remove the paper and place in a shady place, "*potting off, when sufficiently strong, into small pots; place* "*the pots near the glass in a frame or green-house* . . . . One "caution is necessary—*never use peat mould, or any soil* "*liable to cake on the surface or turn green,* as the loss of seed "is a certain consequence."

The plants, if generously treated, will amply repay the cultivator by splendid blooms. As they grow, they may be shifted to larger pots. They should be watered in the morning, and only so much given to them as they require. Overwatering makes the soil sodden. Plants may be kept over till the following year. Should they be kept over one year, they will have to be re-potted at different periods. Plants may be obtained from cuttings of double-flowering varieties of the *Chinese Primrose* or *Sinensis Fimbriata*. A dry scorching atmosphere must be avoided as baneful to these plants; therefore they are difficult to grow in the plains of India. Those kinds that flower about January are the best suited for India. The fern-leaved white and scarlet and the new carnation varieties are splendid.

P. S. Rosea fl. pl.: double carmine.

P. S. Alba fl. pl.: double white.

P. S. Fimbriata rosea: rosy crimson.

P. S. Fimbriata alba: white.

Primula Sinensis and *Japonica* seldom do well in the plains; but plants are sent down in November from seed sown in the hills. Care should be taken that their leaves are not watered, and they cannot stand sun. Both *Primula Sinensis* and *Japonica* are a little more difficult to raise from seed than *Polyanthus*. Messrs. H. Cannell and Sons have made some good improvements in *P. Sinensis* well worthy of recording. The flowers are well raised above the foliage in long scapes and whorls of flowers. *P. Auricula* are probably the most difficult species to deal with even up in the

hills, as they are liable to damp off in the rains, but they are well worth the trouble. *Primula Lord Beconsfield* varieties are very handsome. They flower in spring, and are of many different colors. They are totally different from what we are accustomed to see. Among them is a beautiful blue. *P. Seoboldi*, *P. Alpine species*, *P. Sinensis alba plena*, *P. S. Alba plena fimbriata*, *P. S. Marchioness of Exeter*, a great acquisition; *P. Acaulis*, purple, crimson velvet, cloth of gold, lilac. *Croussei flore pleno*, *Platypetala plena*, rose, sulphur white.

PRITCHARDIA.

Nat. ord., Palmæ.

These include some of the handsomest palms we grow. They thrive well with us in India. Like all palms, they require careful watering, and lots of it, from February on to November, or during the warm months. *P. Grandis** or *Licuala Grandis*,* *P. Filifera* syn. *Washingtonia filifera*, *P. Gandichaudii*, *P. Macrocarpa*, *P. Martii*, *P. Pacifica**, *P. Pericularum*,* *P. Vuylslekiana.** Those marked thus* are the best.

PRYCHOSPERMA.

Nat. ord., Palmæ.

These are a genus of unarmed palms which are very handsome. *P. Alba*, *P. Alexandræ* are cultivated in Calcutta Other handsome species are *P. Cunninghamiana* and *P. Seemanii.* They require the same treatment as other palms, and lots of water during the warm months.

PSORALEA.

Nat. ord., Leguminosæ.

These are small plants—annual, biennial, perennial—so called *Psoralea*, on account of the warty-like points which are sprinkled all over them. They do not do well in the climate of Bengal, and are more suited to the North-West Provinces

and hills. They do best in a light rich sandy soil, and are propagated by division of the roots and cutting of half-ripened wood. *P. Aculeata*, blue and white flowers mixed. "Leaves trifoliate, cuniform, ending in recurved, mucrone, glabrous stipules, prickle-formed." *P. Pinnata*, flowers striped blue. Leaflets linear, as well as the branches, covered slightly with warty dots.

PSYCHOTRIA.

Nat. ord., Rubiaceæ.

Perennial herbs of not much interest, though some of the species have medicinal qualities. *P. Cyanococca* bears white flowers, after which berries of a bright blue color are produced in clusters of about thirty to forty. Its leaves are elliptic, slightly waved at the edges. Useful for decorations in cold climates in winter, when the berries are ripe. Propagated by cuttings in the rains.

PUNICA-GRANATUM.—*(Pomegranate.) (Shrub.)*

Nat. ord., Lythraricæ.

Punica Granatum flore-pleno.—A very handsome shrub with splendid vermilion flowers, which are double. It should be thinned out in pruning, and not cut down indiscriminately, as the flowers are borne on the extremities of the branches formed of the current year's growth, so that only weakly branches should be thinned out.

P. G. Nana.—A small shrub, an improvement on the first mentioned, with double flowers. The plants only grow from a foot to two feet high, and there is a white variety also of the same. The single variety is also very pretty.

QUAMOCLIT.—*(Cypress vine. A small creeper. Annual.)*

Nat. ord., Convolvulaceæ.

Q. Pennatum.—A plant with much divided foliage, of graceful habit. This plant bears vivid scarlet star-like flowers on the top of a tube of the same color. Sow the seeds in

the plains from September to November, and in hill-stations in spring. In the plains the seed may be also sown in February and March It is best to sow the seed, where the plants have to remain, in a light soil.

Q. Phœnicea.—A plant with flowers much like the last, but of a less brilliant color. Its leaves are heart-shaped. Requires the same treatment.

QUASSIA.—*(Shrub.)*

Nat. ord., Simarubaceæ.

Q. Amara.—This plant is a native of Surinam, where it grows to the size of a large tree, but here it grows to only about seven feet in height, and is justly considered one of the choicest and most beautiful plants of our gardens. The leaves are unequally pinnate. Leaflets obvate, four inches long or less. Bears flowers of a crimson-scarlet color like *Erythrina.*

Propagated by cuttings placed under a hand-glass in sand.

QUISQUALIS INDICA.—*(Rangoon Creeper.)*

Nat. ord., Combretaceæ.

These plants require a strong trellis. They flower during the rains and hot season; the flowers are white the first day and fade to red the next. The mixture of colours on the same plant is very effective. Should be cut down in the cold season. Propagated by layers and cuttings in sand.

RANUNCULUS.—*(Florists' flower. Tuberous plant.)*

Nat. ord., Ranunculaceæ.

The *Ranunculus Asiaticus*, or Florists' Ranunculus, requires a retentive soil, good and well-decomposed stable manure mixed with it to within three inches of the surface, and this portion should be loam and leaf-mould in equal parts. There should be twelve inches of good rich soil to

insure the successful culture of this plant. Plant the tubers in October. Place them in beds or boxes in the above compost four inches deep, and with a sprinkling of sand just below each tuber. Place them five inches apart from each other and press each tuber down firmly, claws downwards and crown upwards, then cover them with sand. The crown should be then two to three inches below the surface. Care should be taken that the foliage is never watered. After they have done flowering, the tubers must be taken up; for if left in the soil they will start into growth again and die off. In show plants, only two buds should be allowed, not more. Never allow the plants to seed, it spoils the tubers, for their flowers are never so good afterwards. When the roots are taken up, dry them in shade, and keep them free from damp, in boxes of dry sand in a cool place. To raise plants from seed, the same precautions will be required to be taken as that for the *Anemone* (see ANEMONE), and the roots stored as recommended above, after they have done flowering.

These are splendid flowers, and all the care that can be bestowed on them will be amply repaid. Flowers, from seedlings, cannot be expected to be as fine as those from imported tubers, as the plants require cultivation—being strictly Florists' flowers When they are in bud, watering with liquid manure is highly beneficial, and will improve the flowers. Insects are apt to attack the foliage; especially a variety of caterpillar, which should be hunted up and destroyed, as its ravages on these plants are very baneful, and splendid buds and flowers may be cut off in one night and all labour lost for a season. There are many varieties called *Persian*, *Scotch*, and *Turban*, etc., all truly beautiful flowers. Next to Tulips, they are the most beautiful gaudy flowers our gardens possess, and some prefer them to those stiff flowers. Propagated by offsets, by dividing the tubers, and by seed. By offsets is the usual method. In hill-stations, January is the best time to sow Ranunculus, in a cold frame.

RAVENALA.

Nat. ord., Scitamineæ.

This is a tree much resembling a plantain. *R. Madagascarensis*, or the Travellers' tree, is well known in Calcutta. It grows easily in almost any soil. The leaves are alternately placed on the stem, sheathed at the base. Propagated by division. *P. Guianensis.*

RAVENIA.

Nat. ord., Rutaceæ.

Plants much like *Lemonia* and requiring the same treatment. *R. Rosea*, rose. *R. Spectabilis*, reddish scarlet. *R. Humilis*, white. They are all handsome shrubs and thrive in any good garden soil. Propagated by cuttings taken during the rains.

RESEDA ODORATA.—*(Mignonette. Annual.)*

Nat. ord., Resedaceæ.

Mignonette should be sown thinly, where it has to remain, in September, October and November in the plains, and in spring in hill-stations. It requires no description, everyone knows what Mignonette is. All that is necessary to show is how to grow it. It requires a light and rich soil—the richer the better. It may be sown in boxes, in the open garden, in jardinettes, or elsewhere. Water it frequently with liquid manure. It is a greedy plant, and requires it. It simply grows weedy and useless when not cultivated in a rich soil and watered with liquid manure, besides having lots of sunlight. There are many varieties of it: *M. Ameliorata* (the Tree Mignonette) is redder than other varieties, perhaps more compact and robust in habit. *M. A. Pyramidalis gigantea* has large flowers, and so has *Parson's white flowering.* There are endless good varieties called *Nanas, Compactas, Pyramidalis*, etc., etc. It is only necessary to select some good variety: new varieties come out yearly. The *hybrid*

tree Mignonette is a good variety, and grows to three or four feet if trained properly. It must be sown in a pot. Take out all except one plant, and that must be near the centre of the pot. This must be treated by pinching off all side shoots. The pot must first of all be well-drained. One-third of it must be filled with drainage and the remainder with rich light compost and a handful or two of mortar mixed with it. Place a stick in the pot to support the plant, and keep the pot in a partially shady situation. Do not allow the plant to flower till it attains a good size. It must be allowed moderate sunshine. Water the plant with liquid manure once or twice a week, and only let it branch after it has grown about a foot high or more. *Mignonette Golden Gem, Bird's-mammoth, Miles'-spiral, Golden-queen, Machet's Perfection* are all good sorts.

RHAPHIOLEPSIS.—*(Indian Hawthorn.)*

Nat. ord., Rosaceæ.

Erroneously spelt *Raphiolepsis*. There are about five species of pretty shrubs or trees. *R. Indica*, or the East Indian Hawthorn, has pretty, dense foliage. The leaves are ovate-lanceolate, and it flowers in February with pretty white or pink-tinted blooms the size of the English Hawthorn in terminal panicles. *R. I. Phaeostemon*, flowers white with brown filaments. *R. I. Rubra*, flowers reddish. *R. I. Salicifolia*, flowers white, leaves willow-like. *R. Japonica-integerrima*, flowers pure white, fragrant, in terminal panicles. The leaves are alternate, 2 to 3 inches long, broadly obvate, dark shining green above, and paler below. This shrub is quite hardy and will grow well in the hills.

RHAPIS.

Nat. ord., Palmæ.

These are very pretty, more cane-like than palm-like plants, and deserve to be more cultivated in our grass conservatories than they are. In fact *R. Flabelliformis* is the

fan-leaved ground rattan cane of China and Japan. The leaves are petioled, five to seven parted, thorny along the edges and keel of the plaits. Stems 1½ feet high, as thick as the thumb, reticulated with the wiry substance of the base of the leaves. *R. F. Foliis*, variegated leaves, freely striped white. *R. Humilis*, low growing, leaves cut in seven to ten segments, unarmed; otherwise much like *R. Flabelliformis.*

RHIPSALIS.

Nat. ord., Cacteæ.

A genus of Cacteæ which has peculiar elongated terete or leafy dilated stems. Their flowers are borne along these stems, rarely at the ends of them. They should be grown in a compost of sandy soil, leaf-mould and brick rubbish. Propagated by cuttings planted in gravelly soil, or brick broken up. *R. Cassytha*, flowers greenish white and numerously borne all along the plant, followed by mistletoe-like berries. *R. Houlletii*, flowers straw-colored; numerous. Branches pendulous, green tinged brownish purple. *R. Salicornoides*, flowers small, yellow, not very interesting.

RHODANTHE MANGLESII.—*(Annual.)*

Nat. ord., Compositæ.

These are lovely little pot plants, and also succeed in the garden, but not so well in the plains. They succeed best in a light rich soil. Sow the seed (after steeping it in tepid water) in a shady situation in pots. When strong enough, prick them out and transplant them. Frequent transplanting benefits them, and increases the size of their flowers, which are bright rose, the calyx being silvery. *Rhodanthe maculata* is a novelty, with flowers quite two inches in diameter, rosy purple, and a yellow disc, surrounded by a conspicuous dark crimson ring. In hill-stations, sow in spring in ribbons, beds and pots. They are exceedingly pretty and deserving of attention, especially the first class novelty called *R. Maculata.* In the plains sow in October and November.

RHODEA.

Nat. ord., Liliaceæ.

R. Japonica is much like an *Arad*, bearing panicles of white flowers followed by berries. *R. J. Areo-variegata* has golden variegations in the leaves Propagated by seed in the rains. These plants are best grown in the grass conservatory, as they require a certain degree of shade and moisture. The best compost for them is light and sandy loam, well drained.

RHODODENDRON.—*(Shrub. For Hill-stations.)*

Nat. ord., Ericaceæ.

The most magnificent of flowering shrubs is the Rhododendron They grow wild in the Himalayan range. There are hundreds of cultivated species, so it would be useless to enumerate them, besides their names would take up too much space. They have been multiplied and improved by crossing since the rise of the great Bagshot and Knaphill Nurseries in England, and are so cheap as to be brought within the reach of all; and yet there are many fine specimens so valuable as to continue only the luxury of the rich, which may easily be conceived when I state that they cost from 15 shillings a hundred to 15 guineas a plant. In England nothing is considered equal to the common *Ponticum* for underwood for game in plantations, and of this class there are no less than eighteen or twenty varieties, including almost every shade of color. Then there is the *Catawbiense* variety, which has been equally fruitful in hybrids, and presents a most formidable list of albums, roseums, purpureums, splendens, etc., *ad infinitum*. It is best to leave the selection to a nurseryman, unless you have considerable experience; but the following are perhaps as good as any:—

Maculatum grandiflorum.
Roseum picturatum.
Blandyanum.
Aclandianum.
Atrosanguineum.
John Waterer.

Nobleanum.	*Duchess of Sutherland.*
Mrs. John Waterer.	*Parryllianum.*
Victoria.	*Towardiana.*

They bear frequent removal, but care must always be taken not to break the ball of earth round them or loosen the soil from the stem. It is a mistake to think they grow in peat alone; any light vegetable soil of a sandy character will answer well enough. The dwarf Rhododendrons are suitable for rockwork edging to clumps of the strong growing varieties, and then there are more tender varieties grown in green-houses and conservatories in England. For growing in the hills I recommend the half hardy varieties. The hardy varieties will not flower freely.

ROGIERA.

Nat. ord., Rubiaceæ.

R. Thyrsoides.—This is a shrub with ovate leaves which are 3 to 6 inches long, pointed, smooth above, velvety or hairy below. Flowers rose-colored, borne in pyramidal panicles which are hairy or velvety. A light soil suits this plant. Propagated by cuttings

RONDELETIA.

Nat. ord., Rubiaceæ.

R. Puniceæ is a common shrub in our Indian gardens, which is pretty with its orange-scarlet blossoms which are borne in heads almost at all seasons. *R. Odorata*, flowers vermilion, fragrant. *R. Purdiei*, pale yellow, fragrant. Propagated by cuttings, which take some time to root, or by seed. *R. Gratissima*, pink, sweet-scented, very pretty. *R. Amœna*, pretty pink, with golden beard at the throat: a fine species from Guatemala.

RHYNCOSPERMUM.

Nat. ord., Apocynaceæ.

R. Jasminoides.—A small creeper, with pretty shining oval pointed leaves, bears pretty fragrant white flowers, the corollas

of which are twisted. A choice plant, which in the hills is almost always in flower, except in the depth of winter.

RICHARDEA.

See *Arum*.

RIVEA.

Nat. ord., Convolvulaceæ.

R. Bona Mox.—See *Ipomœa*.

ROSA.—*(The Rose.)*

Nat. ord., Rosaceæ.

The Queen of Flowers has many varieties that are natives of our Eastern clime, and the greater number of such varieties (with a few solitary exceptions only) that have been imported, and which belong to the class of autumnal bloomers, succeed in this country, where they have found soil and climate both congenial to them. Not so, however, the summer roses, which can only be cultivated with success in hill-stations at altitudes over 4,500 feet above sea-level.

SUMMER ROSES are as below, suited to cultivation in hill-stations only :—

1. The Cabbage or Province Roses: *Rosa Centifolia.*
2. „ Moss Rose: *Rosa Centifolia Mucosa.*
3. „ French Rose: *Rosa Gallica.*
4. „ Hybrid Province Rose: *Rosa Centifolia Gallica Hybrida.*
5. „ Hybrid China Rose: *Rosa Indica Hybrida.*
6. „ Hybrid Bourbon Rose: *Rosa Bourboniana Hybrida.*

7. The Damask Rose: *Rosa Damascena.*
8. „ Scotch Rose: *Rosa Spinosissima.*
9. „ Sweet Briar: *Rosa Rubiginosa.*
10. „ Austrian Briar: *Rosa Lutea.*
18. „ Double Yellow: *Rosa Sulphurea.*

CLIMBING ROSES which are also summer roses:—

1. The Ayrshire Rose: *Rosa Arvensis Hybrida.*
2. „ *Rosa Multifolia.*
3. „ Evergreen Rose: *Rosa Sempervirens.*
4. „ Boursault Rose: *Rosa Alpina.*
5. „ Banksian Rose: *Rosa Banksiæ.*
6. „ Hybrid Climbing Roses.
7. „ Wild Rose.

AUTUMNAL ROSES, most of which succeed in the plains and all do well in hill-stations:—

1. The Perpetual Moss Rose will only suit hill-stations, as also the following No. 2.
2. „ Perpetual Damask Rose.
3. „ Hybrid Perpetual Rose, a very large class.
4. „ Bourbon Rose.
5. „ China Rose.
6. „ Tea Scented Rose.
7. „ Miniature Rose *(Lawrenciana).*
8. „ Noisette Rose.
9. „ Musk Rose.
10. „ Macarthey Rose.
11. „ Microphylla.

The propagation of the rose is carried on in various ways, as hereafter mentioned, and new varieties are introduced chiefly by plants from hybridised seed; and a few are sports: but the rose does not sport freely.

Propagation by seed.

I insert here how roses may be propagated from seed should some of the amateur readers feel inclined to try it, for it is a most interesting field for experiment.

China and Tea-scented and China Roses are placed under glass in England to ripen their seeds, but this is not necessary in India. Mr. Paul, the great Rosarian, gives a list of roses which ripen their seeds perfectly in England: they are all included in the following list: four sorts Hybrid China; three sorts Hybrid Bourbon; two Moss Roses; four Hybrid Perpetuals; one Austrian Briar; one Bourbon, one Rosomène; one French; one Multiflora and one Ayrshire.

In this country, vegetation is perhaps too vigorous, and this is an obstacle to be guarded against. Mr. Paul says, avoid rich soil; it promotes vigour in their growth. See how to fecundate your roses in the article on hybridizing, and protect the seed from the ravages of birds by a net, or you can try any ripe seed of roses, trusting to accidental fecundation by insects, etc. The majority of roses sent over from France to England are the result of accidental fecundation. In England the fecundation is generally done artificially.

If you sow the seed when it is ripe, but not dried, it will take a year to germinate; wait till the seed pods are almost black, dry them carefully and sow thickly (for only a third or fourth of the seed will germinate) in boxes after having first steeped the seed (if first dried) for three hours in tepid water, care being taken the germ is not destroyed or injured. Cover with glass admitting a little air. The soil should be of a light nature and the seed not planted too deep. Keep the soil moist, not wet, and the seed will go on germinating at irregular periods from two to three months. Protect from sun, and when the young plants are up, only expose them to the sun gradually. All the first flowers will be small, probably not larger than cherries. You must wait till the second year, and then select from them those that are the best in color, size, form and fullness of petals; you may even

have to wait longer to make a selection. But at last you may be rewarded, and how great the pleasure!

Propagation by cuttings by the new American method.

Propagation by cuttings may, with the greatest success, be carried on by the adoption of the new American system, as related in full at page 69 *(see Fig. I, Plate 1)*, at almost any season of the year: it has been found the most successful method. Only one caution here is necessary, and that is, when the cuttings are first planted out in pots, they must be kept in shade for a few days, then only gradually exposed to sun in the morning till they are strong. It is at this period you will find some may die off if too rapidly exposed. I think it is best to plant these cuttings in pots first, and when they are hardened off to plant them out. The soil they are planted in at first should not be at all stiff nor too heavily manured. Very little manure suffices at this time, till the period the cuttings are well rooted and established plants, and are finally planted out in the border or have grown and require repotting again. See also propagating under glass as in plate 1, page 70. The cuttings should not be more than from six to nine inches long.

Propagation by cuttings under glass, also in open borders.

Or cuttings may be put out in the open when they are shaded with matting. Dig trenches, about the width of a hoe, six inches apart: with these plant your cuttings should be slantingwise at regular intervals of three or four inches, and tread the soil well down round each cutting, and water at regular intervals according to weather, more or less copiously; at first giving less water than you would after a time (when the cuttings begin to grow). Tea and Noisette Roses root best during the rains, while cuttings of other varieties do best at the close of the rainy season. In striking cuttings, I believe the most successful method is the American way of doing so, though there is some loss when first planting them in pots.

Time to strike cuttings of different varieties in beds or boxes.

Propagation by layering.

The next and most certain plan of propagating in India is that by layering described at page 77, where a full description is given of how to proceed; and this too, like the American method, can be practised at all seasons.

Propagation by grafting.

Propagation by grafting by approach I do not recommend; as the juncture often forms into a large knot, and arrests the sap, not unfrequently causing canker.

Propagation by budding.

Propagation by budding is followed out with the greatest success in some parts of India, chiefly where the climate is driest—Upper Bengal, Behar, and the North-West Provinces. The process is described at page 74, and this can be done during the dry months, but perhaps the best season is after the rains. When the bark separates from the wood, at whatever time that may occur, is the period to be looked for in budding as most favourable, and it varies, not only with the season, but the condition of both stock and bud. Budding is not so successfully or frequently done in Lower Bengal, but in Upper Bengal and the North-West Provinces it is easily and successfully done at almost any season.

Forms of growing Roses.—Dwarfs.

Dwarfs are either roses on their own roots (which I consider the best way to grow them) or they may be budded underground on the root just below the surface or just above it.

Standards and their several modifications, Umbrella, Fountain and Weeping Roses,—Half and Full Standards.

Standards.—These are not desirable in India for many reasons; as also, I may say, in all countries, unless well constructed and grown, are unsightly, owing to the long stem they are grown on according to the height the buddings are placed on the stock. When budded lower than full standard, which are about three and-a-half to five feet in height, they are called half standards, which are two to three feet high.

Modifications of the standard are Fountain, Umbrella, and Weeping Roses. These are popular in England; with the exception that the flowers are raised higher up to view. There is nothing more to recommend these forms in the smallest degree, and I hope they may never become popular in this country.

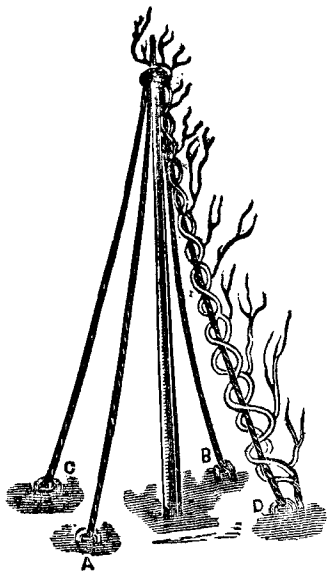
A great advantage in dwarfs on their own roots is that there is no danger of suckers coming up from the roots and destroying the budding, and these are sometimes very troublesome. Duc-de-Berri, Rose Edouard, and Gigantea all make good stocks, as also Archduke Charles. Perhaps the best form to grow roses is the pyramidal, either on its own roots, or budded just near or at the surface of the soil. Given we have a plant, we proceed. Train the leading shoot straight up to an iron rod—(wood decays and causes damage not unfrequently by being blown down, uprooting the plant). If the soil is rich and good, the main shoot will attain a height of six feet or more in one year; keep this main shoot free of all side shoots at its foot for the first year, or nearly so; next season cut the top off, leaving only four feet below. After this, the side shoots should be pruned to four or five inches when they have done flowering; and the following season, the leading shoot should be shortened as high only as you wish your pyramid, and the side shoots pruned so as to make the pyramid perfect.

Pyramid Roses.

First, the strongest and most vigorous roses must be selected for pillar roses; *second*, the soil must be rich, so that they be well clad with foliage; and *third*, they must have strong supports, such as an iron rod, with three or better four chains from its summit to the ground, as per illustration. The first year, after planting, let one plant at each chain grow as they choose to do so, *after one pruning*, which must be within three or four eyes of the root of each plant. The second year, prune *all but two* of the tallest branches: these should only be shortened; after that

Pillar Roses and how to form them.

they should be laid flat on the ground and pinned down; they will produce numerous laterals, thus treated; prune these back to two or three eyes to make them send out off-shoots. Now erect and entwine the two leading shoots round each chain. When the latter shoot again, they should be tied downwards to make shoot further till the entire pillar is thoroughly clad.



Trellis Roses may be treated in exactly the same way, as also roses to cover bowers, for this form even admits of less trouble in training.

On pruning Roses: Summer Roses.

In this prescribed space, pruning can only be treated generally as to Summer and Autumnal Roses. The Summer Roses must not be pruned heavily, only thinned out of twiggy growth and the longest shoots shortened. This must be attended to, mostly in the centre of the bush as regards twiggy growth. The Moss Roses of this class may be pruned more heavily, as also Hybrid Bourbons, Hybrid China Roses and Perpetual Damask Roses.

Hybrid Perpetual almost all require being pruned closely to four or five eyes; but bear in mind, some are weaker growers than others, and they require to be less heavily handled. Tea and Noisette Roses require very careful pruning, only shorten long shoots slightly, and thin out weak laterals; an injudicious use of the knife ruins them. Bourbon Roses may be pruned much the same as Hybrid Perpetuals, and China Roses must be less heavily handled.

On pruning Roses: Autumnal Roses.

The best time for pruning is the end of the rains, at least a month or even two after it is over, when ever that may be in the different parts of India. *Nothing is gained by early pruning;* in fact it often may be found the last pruned roses are the first to flower; the chief consideration being that the wood is ripe when pruning is done. Roses may also be pruned in spring, before the sap begins to rise, or they are beginning to bud into growth. This being when the soil has been very rich and the growth abnormal. Generally speaking, prune in Lower Bengal in November; in Upper Bengal and Behar, the latter period of October and November; and in the North-West Provinces, in the latter part of September and October. Some seasons are earlier, others later, as regards the rains passing off; this must be borne in mind.

Time best for pruning.

Incinerated soil is excellent, burn it in exactly the same way bricks are burnt, a layer of faggots, then a layer of earth, and so on, plastering the whole carefully over; and this is most necessary when the soil is too retentive. Brick pounded to a powder is very good and just what is required.

Manures—The best which to avoid.

Cow manure is excellent, and, I think, the best thing that can be used; "seethe" or refuse Indigo Stalk is excellent as far as my experience has guided me. Mixed farm-yard manure is good. Guano is better for the production of leaf than of the flower of the rose, and is good in cold soils. Bone dust or bone meal is of great importance.

Horse manure must be very old if used in the plains, and then must be used with care. It is safer to use stable manure in the hills: I do not recommend it in the plains. It is good when the soil is very stiff and adhesive, but when the soil is light, cow manure is best. Soot, the sweepings of chimneys, is good to expel the wire worm from potted roses, as well as acts as a manure.

Liquid manures should be applied weak and often quite clear, and not muddy, to the roots of roses, when they show signs of flagging in growth: particularly when the flower buds are swelling and the roses are in flower.

Artificial Wintering after pruning.

A few days before pruning, remove about 1 to 1½ feet of earth all round the plant, to a depth according to the size and strength of your rose—deeper as your plant is larger, and less as your plant is small. This should be done with a pointed stick or piece of iron in a handle like a *khoorpee*, so as not to cut or bruise the roots. Thus expose the roots till the leaves show signs of growing yellow, and some are falling off daily. This should be in a week or two weeks if the pruning has been done at a proper time. Then fill in a small portion of the earth, say one-fourth, with three-fourths manure of the best description mixed with it, and press down *firmly* with the feet all round your plant, and do not water your roses till they show signs of budding into fresh growth again, unless the weather is very dry and the atmosphere likewise so.

On watering Rose Plants, and the effects of not doing so

A great error is committed in watering roses with just a sprinkling of water. A rose plant, of fairly large dimensions, requires a bucket of water every second, third or fourth day according to the state of the weather, and they suffer much if they do not receive it, in which case they throw down roots further and lower into the soil, where they are not so easily treated, and the flowers of the plant then begin to degenerate, grow smaller, irregular in form, and flimsy in texture.

How to import Roses from England or the Continent, and how to grow them in pots.

Roses, when imported, should be ordered from England during their season of rest (November, December, and January). The order should be given two or three months previous to their despatch, so that they may be prepared by drying and packing in dry moss, if they are not packed in small pots in Wardian cases. On arrival, put the box in a cool dark room, and, on the second day, remove the lid. On the third day, bind the branches with moss and pot them; press the compost (which should be light, and with not much manure in it) well; roses require to be planted with the soil *firmly* pressed round their roots. A little charcoal, the size of peas, and some sand mixed in the compost will keep it from turning green and mouldy. Plants sent in Wardian cases are expensive, but require less care.

Boxes and tubs are better than pots.

Pots made of wood are better than earthenware vessels, and the former, made of the simplest shape and painted, look well. The radiation from a good conductor, as earthenware, is objectionable. See that your pots are well drained. Also pot your plants in what is suitable to their size; don't over-pot them. Pot-bound plants are well known to Horticulturists and produce the most flowers; and the rose is no exception to the rule. Shift often, but never over-pot. No water should be given for the first week or ten days, keep the room rather dark and closed: sprinkle the walls and floors copiously with water at frequent intervals during the day, never letting them get at all dry, or it may be fatal to your plants. If you have no conservatory, a bath-room is as good as anything you require for the purpose in question now.

When the plants begin to throw out leaf buds, expose them gradually to stronger light, then to morning sun, and so on till they can be planted out in beds, or reared in pots or small tubs, and larger ones as they grow. The compost then used should be of the richest description (that is, when

the plants are well established). According to the nature of the soil, which may be rich or poor, add ¾ to ½ of old cow-dung, bone dust and soil, mixing leaf-mould or "seethe" (refuse Indigo) stalk, which is highly impregnated with ammonia, and is excellent manure, especially for retentive or clayey soils.

How to form beds.

A soil for roses can barely be made too rich. I would suggest that, when beds are to be made for roses, three or four feet in depth of soil should be removed, and four feet in width, or even six feet in width, for any given length the beds are to be. At the bottom of this, lay tiles of slate, two layers thick, or bricks closely set together. Then put down drainage, and fill in prepared soil, mixing turfy loam made of parings of turf, bone dust or bone meal, cow-dung (old), horse-dung (which must be much older than cow-dung. The horse-dung for such purpose should not have been allowed to dry at any time, or it will burn the plants, and I do not recommend it to be used in the plains of India, though it may be used in the hills), and "seethe" as before mentioned. In beds six feet wide, two rows of large sized growing roses could be advantageously planted, at about four feet apart or more; when an occasionally larger growing plant of most robust variety may be here and there planted in the centre of the bed at intervals, to break the monotony of planting.

I warn the Amateur against procuring plants from small native *malies* in Calcutta. There are large dealers that can be depended on to supply plants true to their names: Baboo S. P. Chatterjee, of the Victoria Nursery, 78, Narcoldanga Main Road, Calcutta, and some few of the larger native nurserymen can be depended on, as well as European dealers in Calcutta. Some of the public gardens up country too supply varied lists of fine and good roses at most moderate rates. Mr. C. G. Ollenbach, of Dehra Dun, N.-W. P., has a fine collection of the newest roses which have won medals or have obtained first-class certificates from the Horticultural Society and other

shows, which stamp them as unquestionably first class. I have grown them in this country and found them very fine, though some of them are liable to mildew, of which note has been made in due course.

More about Roses grown in pots

Roses grown in pots require good drainage, and if they are exposed to all weathers in the open, rain soon makes the soil sodden; a pointed piece of stick should be run down, once a week or so, between the pot and earth in it. This is a precaution which will soon shew good results; if you have grown roses in pots, and have not done so before, do it now. Another admonition is that you should never, by any chance, let your potted roses grow dry and droop in their growing season, or more importantly so during their flowering season, or just at the season of your triumph your roses will stop blooming. If by any chance roses in pots require watering during the day, or droop for want of it, remove them into shade (or shade them with matting if the tubs be too heavy to lift). Let them cool for an hour or two; then water them.

Artificial wintering is as necessary for pot roses as for those grown in the open border; therefore, at that time by degrees withhold water and treat them exactly as recommended for those in borders of the open garden; only less soil must be removed from the surface of the pot, according to the size of the plant, and they will require to be less heavily pruned.

Roses in the ground or in pots, to obtain large flowers.

When your roses are in bud, some of them may be crowded with too many buds; and they may not, if all are left on the plants, open well. The only alternative is, especially with some roses which do not open well, to pick a few off each branch at least, and sacrifice some, or the entire lot may not open well. By retaining all the buds, the flowers cannot be large. Added to sacrificing some buds, when your plants are in bud, water with liquid manure fairly strong (for roses can stand it) once or even twice a week.

With the above remarks before you, if carefully followed out, success will follow, and you will be fully repaid. Ample instructions have been given on all points of rose culture, and below is a list of roses which should satisfy the most ardent Amateur cultivator of our Queen of Flowers. For more minute instructions, see "Indian Amateur Rose Gardener;" however, all the practical cultivation of the Rose has been abridged and placed in these lines before the Amateur:—

HYBRID PERPETUALS.

Descriptive list of 25 Roses, shaded Purple, Blackish Crimson, and Crimson Scarlet.

1. *Alfred de Rougemont.*—Dark deep velvety purplish crimson, of fine form and vigorous growth.
2. *Antoine Ducher.*—Rich dark crimson, flowers globular and splendidly shaped. (Raised by Ducher, 1866.)
3. *Baron de Bonstetten.*—Rich velvety purple, very dark, superb on first opening, of vigorous habit. (Raised by Liabaud, 1871.)
4. *Black Prince.*—Deep blackish crimson, large and full.
5. *Charles Lefebre.*—Dark crimson scarlet, shaded with violet, very distinct. (Raised by Lacharme, 1862.)
6. *Sir Rowland Hill.*—Rich deep port wine color, shaded maroon, changing to a bright ruby claret. A superb flower and free growing plant.
7. *Charles Wood.**—A beautiful darkish crimson of fine form.
8. *Docteur Audry.*—Large dark red, of fine form and with vigorous growth. (Raised by E. Verdier, 1865.)
9. *Duc de Cazes.*—Deepest crimson scarlet, large, very double, and splendid: a vigorous grower.

10. *Duke of Edinburgh.*—Rich deep crimson, very dark. (Raised by William Paul, 1868-69.)

11. *Ferdinand de Lesseps.**—Purple, shaded with violet, large and full, of the most exquisite form, of vigorous growth. (Raised by E. Verdier in 1869.)

12. *Gloire de Ducher.**—Dark crimson, of most exquisite form. (Raised by Ducher.)

13. *Horace Vernet.*—Dark and large flowers, reddish purple, shaded crimson, of robust habit. (Raised by Guillot, junior, 1866.)

14. *Earl of Dufferin.*—Velvety crimson, shaded maroon; large and full. A new gold medalist.

15. *Louise Van Houtte.**—Fiery blackish crimson and red; a fine rose. (Raised by Lacharme, 1869.)

16. *Marechal Vaillant.*—Brilliant scarlet, very full, and of fine form, excellent; of vigorous growth. (Raised by Jamain.)

17. *Madame Jacquier.*—Beautiful Bishop's purple, very large and very full, globular; of good habit, and vigorous growth.

18. *Pierre Notting.**—Shaded purplish crimson, large, globular, full, and of the best form; first rate; of vigorous habit. (Portemer, 1864.)

19. *Pitord.*—Rich scarlet, centre deep velvety purple; large, fine, and full form; vigorous. (Raised by Lacharme.)

20. *Prince Camille de Rohan.**—Dark, intense velvety crimson, of fine form, of vigorous growth. (Raised by E. Verdier, 1862.)

21. *Reynolds Hole.*—Crimson, cupped, full, and of good form and vigorous growth. (Raised by Paul & Son.) One of the best dark roses ever raised.

22. *St. George.*—Dark crimson, large and globular, of vigorous habit. (Raised by William Paul, 1874.)

23. *Xavier Alibo.*—Velvety blackish red, most beautiful and rich color. (Raised by Lacharme, 1865.)

24. *Vicomte Vigier.*—Intensely dark and rich velvety crimson and lilac, a superb color: habit vigorous. (Raised by C. Verdier, 1862.)

25. *Jean Soupert* or *Grand Mogul.**—Very rich black crimson and scarlet. A splendid rose.

Descriptive list of 28 Roses, shaded Crimson, Scarlet, Red, Crimson and Deep Carmine.

1. *A. K. Williams.*—A most perfect rose of the first class, rich velvety crimson, shaded.

2. *Waltham Standard.**—A new rose, brilliant carmine, shaded scarlet and violet. A fine exhibition rose.

3. *Alfred Colomb.**—Bright crimson, large and full, of beautiful form, globular. (Raised by Lacharme, 1865.)

4. *Annie Wood.**—Brilliant crimson scarlet, large and full, imbricated. A fine pillar rose.

5. *Baron Haussmann.**—Clear carmine crimson flowers of a good size, beautiful and full: a vigorous rose. (Raised by E. Verdier, 1867.)

6. *Cammille Bernardin.**—Bright crimson flowers of immense size with superior form: a superb rose. (Raised by Gautreau, 1865.)

7. *Lady Helen Stewart.**—Bright crimson scarlet, very showy but smallish flowers. Erect growing, long shoots.

8. *Duc de Rohan.**—Bright crimson, shaded vermilion, large, full, globular, and magnificent: vigorous. (Raised by Levegue, 1861.)

9. *Ducheur de Caylus.*—Bright crimson, large, globular and double, a very attractive rose; of moderate growth. (Raised by C. Verdier, 1864.)

10. *Félix Genero.**—Beautiful, shaded pink violet and carmine, large and of good form: a free grower. (Raised by Damaizin, 1866.)

11. *Françoise Fontaine.**—Crimson, shaded with purple, large and of good form: of vigorous growth. (Raised by Fontaine, 1867.)

12. *Bruce Findlay.**—Intense light crimson, very vivid and beautiful. A new rose.

13. *Françoise Lacharme.*—Bright shaded carmine, very distinct and beautiful: moderate grower. (Raised by Lacharme, 1861.)

14. *General Jacqueminot.**—Brilliant crimson scarlet, large and free-flowering; habit vigorous. (Raised by Rousselet, 1855.)

15. *Gloire de Santenay.*—Brilliant red, with a beautiful violet shade: a good rose; growth moderate. (Raised by Ducher, 1859.)

16. *Le Rhône.*—Rich vivid velvety crimson: growth moderate. (Raised by Guillot, fils, 1862.)

17. *Lord Clyde.*—Crimson, deeply shaded purple, large and full: of good growth. (Raised by Paul and Son, 1863.)

18. *Lord Macaulay.*—A splendid rose, though its flowers are variable, ranging from scarlet crimson to plum: large and full: of vigorous habit. (Raised by William Paul, 1863.)

19. *Tom Wood.**—A new rose, cherry red, of fine thick substance.

20. *Madame Marie Rady.**—A shade of light crimson, flowers large and beautifully imbricated; a very elegant flower: vigorous. (Raised by Fontaine, 1866.)

21. *Marechal Vaillant.**—Bright scarlet, very large and full, fine form, excellent: vigorous. (Raised by Jamain, 1861.)

22. *Marie Baumann.*—Bright vivid red, large, full and of fine form. (Raised by Baumann, 1865.)
23. *Mrs. Chas. Wood.*—Brilliant crimson, shaded with purple, a flat large rose: vigorous habit. (Raised by E. Verdier, 1862.)
24. *Maurice Bernardin.*—Bright crimson, large, imbricated, full and fine of its form, first rate: habit vigorous. (Raised by Levegue, 1861.)
25. *Oliver Delhomme.*—Vivid scarlet, full, well-formed, high centre. (Raised by V. Verdier, 1861.)
26. *President Theirs.*—Brilliant vermilion crimson, large and full. (Raised by Lacharme, 1871.)
27. *Senateur Vaisse.*—Dazzling crimson scarlet, large, full and superb: habit robust. (Raised by Guillot, senior, 1860.)
28. *Salamander.**—Very bright crimson scarlet. A large flower and very brilliant.

Descriptive list of 27 Roses, shaded Crimson, Deep Rose, and Cerise.

1. *Annie Laxton.*—Deep rose shaded with crimson, flowers of medium size, very double and beautifully formed. (Raised by Laxton, 1870.)
2. *Baronne Louise Uskull.**—Bright glossy rose, large, full and globular, of exquisite form; of vigorous growth. (Raised by Guillot and Son, 1871.)
3. *Bernard Palissy.**—Brilliant light carmine, large, expanded, and very double: of vigorous habit.
4. *Beauty of Waltham.**—Light crimson, very double, petals of great substance. (Raised by William Paul, 1862.)
5. *Madame Clemence Joigneaux.*—Deep rose, shaded with lilac, of very good form, and excellent for towns; of vigorous habit. (Raised by Liabaud, 1862.)

6. *Countess of Oxford.*—Brilliant carmine, shaded, very large, full and finely shaped: of vigorous habit. (Raised by Guillot, senior, 1869.)

7. *Duchesse de Morny.*—Deep rose, large, cupped, very double and of exquisite form; of vigorous habit. (Raised by S. Verdier, 1864.)

8. *Mrs. R. G. S. Crawford.*—Deep rosy pink, outer petals pale flesh; an excellent new rose.

9. *Etienne Levet.**—Carmine and rose, large and full, very free flowering, a fine rose: habit vigorous. (Raised by Levet, 1871.)

10. *Françoise Michelon.**—Rich bright rose, large and double, moderately vigorous. (Raised by Levet, 1871.)

11. *Glory of Waltham.*—Crimson, finely scented, a fine pillar rose: very vigorous habit, a good rose for town. (Raised by William Paul, 1870-71.)

12. *Horace Vernet.*—Bright purplish red and crimson: petals very large and round, a fine full and splendidly shaped rose, of vigorous habit, and a free flowerer. (Raised by Guillot, junior, 1866.)

13. *Jules Margottin.*—Bright or light carmine, large and full, an excellent pillar rose. (Raised by Margottin, senior, 1855.)

14. *Madame Victor Verdier.**—Large and globular crimson flowers: excellent form. (Raised by E. Verdier, 1864.)

15. *Madame Domage.**—Bright cherry; flowers very large; a robust grower.

16. *Madame Creyton.*—Bright vermilion, shaded violet rose: vigorous habit. (Raised by Gouod, 1868.)

17. *Madame George Schwartz.**—Beautifully shaded rose, large and full, fine form; of vigorous habit.

18. *Madame Marie Cirodde.*—Bright rose, large, full, and well imbricated: very robust.
19. *Marquise de Castellane.**—Fine bright rose, very large and full. (Raised by Pernett, 1869.)
20. *Paul Neron.** — Deep rose, very large, and of fine form, one of the very largest roses: growth vigorous. (Raised by Levet, 1869.) Scentless.
21. *Star of Waltham.*—Crimson, of fine form, and large: vigorous habit. (Raised by William Paul, 1874.)
22. *Souvenir de M. Boll.*—Bright cerise, flowers large and full: of vigorous growth. (Raised by Boyan, 1859.)
23. *Vicomte Vigier.*—Bright crimson, color superb, large. (Raised by C. Verdier, 1862.)
24. *Victor Verdier.** —Deep rose, shaded with carmine, large, full and excellent; vigorous. (Raised by Lacharme, 1860.)
25. *Victor-le-Bihan.*—Beautiful bright carmine rose, very large, very full; growth vigorous.
26. *Vicomtesse de Vezins.**—Large, red, good form; habit vigorous. (Raised by Gatreau, 1867.)
27. *Revd. Alan Cheals.*—Sent out in 1897. Paeony-shaped rose of novel form. Lake color, but reflex of petals silvery white.

Descriptive list of 29 Roses, shaded Rose to Pink.

1. *Abel Grand.**—Beautiful silvery rose, glossy and clear in color, large and full, blooms abundantly. (Raised by Damasin, 1865.)
2. *Mrs. John Laing.**—One of the best roses, soft pink, large, beautifully shaped and fragrant. Best rose at Crystal Palace, 1894.
3. *Alpaide de Rotalier.*—Silvery pink, flowers large, full and well formed, having large smooth outer petals; vigorous habit.

4. *Anna Alexieff.*—Light rose, large and of good form: vigorous. (Raised in 1859.)

5. *Baronne Prevost* *—Rose, flowers large, a free bloomer; vigorous. (Raised by Desprez, 1840)

6. *Comtesse Chabrilland.**—Brilliant rich pink, full globular flowers of the most model form; of robust habit. (Raised by Marest, 1858-59.)

7. *Baroness Rothschild.*—Delicate rose color, shaded with white, globular, large and double, of most perfect form; very robust. (Raised by Pernet, 1867.)

8. *Charles Roillard.**—Pale rose, bright red centre, large, full, and exquisitely formed. (Raised by Eugene Verdier, 1865.)

9. *Charles Verdier.*—Exquisite rose color, edged with white: free blooming and vigorous. (Raised by Guillot, senior, 1866.)

10. *Margaret Dickson.**—Pale flesh centre, petals large, of shell shape. A gold medalist at the Crystal Palace, 1894. Of lovely form, but sometimes liable to mildew.

11. *Gloire de Vitry.**—Bright carmine rose, color exquisite, flowers large and full, of fine form: habit vigorous.

12. *Monsieur Gabriel Tournier.**—Deep rose, very large, full and splendid; a comparatively new rose. (Raised by Levet, 1877.)

13 *Duchesse d'Orleans.*—Beautiful soft rosy peach, globular, large and full: vigorous habit. (Raised by Quetier.)

14. *Elie Morel.**—A most exquisite flower, lilac rose, splendid form, large, novel in color: habit moderately vigorous. (Raised by Liabaud, 1867.)

15. *Josephine de Beauharnais.*—Delicate rose, edged with silver, large, full and fine form; of moderate growth. (Raised by Guillot, fils.)

16. *Louise Peyronny* or *Laelia.*—Satin rose, large, smooth, cup-shaped petals: flowers double and exquisitely formed; vigorous.

17. *La Reine.*—Brilliant glossy rose, globular, very large and full, a most superb old variety; vigorous. (Raised by Laffay.)

18. *La France.**—Silvery peach, beautiful in color, large and full, of fine form, and petals of good substance; of moderate growth. (Raised by Guillot, junior, 1867.)

19. *Lyonnais.**—Light rose with darker centre, very large and well-shaped flowers: vigorous habit. (Raised by Lacharme, 1870.)

20. *Madame Derreux Douville.*—Light satin rose, shaded: vigorous habit. (Raised by Leveque.)

21. *Madame Alice Dureau.*—Bright clear rose, very large, full and globular: vigorous habit.

22. *Madame Furtado.*—Brilliant carmine rose, color fresh and beautiful: moderate grower. (Raised by Victor Verdier, 1860.)

23. *Madame Vidot.*—Delicate pink, of exquisite form.

24. *Mademoiselle Eugene Verdier.*—Flesh rose, large, of good form: robust habit. (Raised by Guillot, junior, 1869.)

25. *Marguerite de St. Amaud.**—Rosy blush, very large, double and fine: vigorous. (Raised by Jamain, 1865.)

26. *Nardy Frères.*—Rosy lilac, shaded with slate, very large and full form; of vigorous habit. (Raised by Ducher, 1868.)

27. *Richard Wallace.*—Very rich deep rose, large and full, a good autumn rose: vigorous habit.
28. *William Griffith*—Pink, of good form: medium growth. (Raised by Portemer, 1852.)
29. *Tom Wood.**—Sent out in 1896. Petals of great substance, large, and of good form. Color bright cherry red.

Descriptive list of 18 Roses, Pink tinted, White, and Pink, all suited for Exhibition.

1. *Auguste Mie.*—Glossy pink, a large globular flower, full and well formed: vigorous.
2. *Mr. Harkness* or *Paul's early blush.*—Pure blush color, delicate and distinct. Musk scented. Globular form.
3. *Caroline de Sansal.**—Deep blush, very large, beautiful and double, a fine old rose: vigorous in growth. (Raised by Sansal.)
4. *Charles Verdier.*—Exquisite rose color, edged with white, beautiful: a free grower. (Raised by Guillot, senior.)
5. *Cecille Chabrilland.*—Pink, of a fine form of habit; moderate growth.
6. *Sophie Coquerel.*—Bright rose, large and full: of moderate growth.
7. *Mrs. Rivers.**—Pale fleshy white, of good form, distinct and showy; moderate in growth.
8. *Miss Ingram.**—Color a delicate blush white, with a deeper tinge of blush in the centre of the flower: fine, round, deep cupped flower; of admirable shape: of moderate growth. (Raised by Mr. Ingram, of Frogmore, 1868.)
9. *Mademoiselle Bonnarie Levet.*—Nearly white: of medium growth. (Raised by Pernet, 1860.)

10. *Mademoiselle Thérèse Levet.*—Rosy pink, large and of good form: vigorous habit. (Raised by Levet.)
11. *Marchioness of Dufferin.*—A grand rose, though sometimes liable to mildew. Color rosy pink base of petals yellow. Awarded four first certificates and gold medal of the National Rose Society.
12. *Princess Beatrice.*—Light peach color, large, full, globular form, fine foliage. (Raised by William Paul, 1873.)
13. *Princess Mary of Cambridge.**—Pale rose, large and full, of excellent form: of vigorous habit. (Raised by Paul & Son, 1870-71.)
14. *Reine Blanche.*—White, slightly tinted with rose, large, full, and fine form. (Raised by Pernet.)
15. *Souvenir de la Malmaison.*—A quartered rose, one not generally allowed in exhibition, but this has good qualities which passes it: a light flesh-colored rose: of fair growth. (A Bourbon rose.)
16. *Thyra Hammrick.**—Very delicate and bright flesh-colored rose, very large and full; growth vigorous. (Raised by Ledechaux.)
17. *Peach Blossom.*—Of a peach color, flowers large, and of good form. (Raised by William Paul, 1874.)
18. *Ulster.*—Bright salmon pink of great substance. Gold medal, National Rose Society.

Descriptive list of Roses which are Pure White, or nearly so.

1. *Madame La Charme.**—White, cupped and double (in bud sometimes shows pink): a fine rose, of elegant form. (Raised by Lacharme, 1872.)
2. *Madame Alfred de Rougemont.*—White (in bud sometimes shaded with rose), very double and elegant: habit vigorous (Raised by Lacharme)

3. *Perle des Blanches.*—Pure white, cupped and double: flowers rather small: habit vigorous. (Raised by Lacharme.)
4. *Coquette des Blanches.*—Pure white clustering flowers, of moderate size and good shape: habit vigorous.

The above is a list of the best Hybrid Perpetuals, of which there are very few of a pure white color.

It would be difficult to give a better selection of Hybrid Perpetuals than above enumerated and accurately described, and though there are several hundred that flood the market, very few appear yearly that are worthy of note.

TEA-SCENTED ROSES & HYBRID TEA SCENTED.

1. *Adrienne Christophle.*—Yellow, copper and apricot, shaded with rosy peach, sometimes deep yellow: large and full. (Raised by Guillot, junior, 1868.)
2. *Exquisite.*—A new rose, introduced in 1899. Bright crimson, shaded magenta, globular, large and very sweet-scented. Vigorous and hardy. A hybrid, tea scented.
3. *Belle Lyonnaise.*—Deep canary yellow flowers, globular, large and full. (Raised by Levet, 1869.)
4. *Mme. H. de Potrowowski.*—A new rose. Amaranth and brick-red color, large and full.
5. *Catherine Mermet.*—Bright flesh-colored rose, large, full, and finely formed. (Raised by Guillot, junior, 1869.) One of the best.
6. *Cheshunt Hybrid.*—A good rose, better known perhaps as the old familiar *Devoniensis*, of which we know more: creamy white, slightly tinted with fawn, large, pretty full, one of the best, deliciously fragrant: of moderate growth. (Raised by Curtis many years ago.)

7. *Gloire de Dijon.*—A celebrated rose, buff with orange centre, very large, full, handsome, free blooming, hardy and vigorous: one of the very best Teas. (Raised by Jacotot in 1853.)
8. *Mrs. Mawley.*—Sent out in 1898. Bright carmine and yellow. Curious and attractive coloring. Gold medal, National Rose Society.
9. *Madame Celina Noirey.*—Salmon rose, flowers large and full.
10. *Madame Ducher.*—Clear yellow and a strong grower. (Raised by Ducher.)
11. *Madame Levet.*—Yellow, shaded salmon, large, cupped and double.
12. *Madame Berard.*—A large salmon and rose flower. (Raised by Levet, 1869-70.)
13. *Madame Falcot.*—An old rose, of medium size, and of an apricot color.
14. *Madame Jules Margottin.*—Coppery and rosy cerise, variable and distinct. (Raised by Guillot, junior, 1871.)
15. *Madame Margottin.*—Rich yellow, with salmon pink centre, good form and a free flowerer. (Raised by Levet, 1866.)
16. *Madame Trifle.*—Deep yellow, shaded with salmon.
17. *Madame Vilermoz.*—Creamy white, with fawn-tinted centre, well formed and of good substance: a superior rose.
18. *Perfection de Montpalaisir.*—Clear lemon yellow, long handsome buds; good and distinct.
19. *Perle de Lyon.*—Deep fawn and apricot, large and globular, one of the best tea roses; superbly formed with handsome dark foliage.
20. *Monsieur Furtado.*—Very bright sulphur yellow, medium size, full and finely formed. (Raised by Laffay.)

21. *Niphetos.*—White with creamy centre, large, globular, and showy.

22. *President.*—Salmon and rose, very large and full, free blooming. (Raised by William Paul: old.)

23. *Reine de Portugal.*—Deep yellow, shaded with rose and copper. (Raised by Guillot, junior, 1867.)

24. *Rubens.*—White shaded with rose, centre of a darker color: form good.

25. *Souvenir d'Elise.*—Creamy white, tinted with rose; an old rose.

26. *Souvenir d'un Ami.*—Salmon and rose, very large and full: most excellent form.

27. *Triomphe de Guillot Fils.*—Fawn tinted with salmon; large, full, well formed, very fragrant and vigorous. (Raised by Guillot, junior.)

28. *Vicomte de Cazes.*—Yellow with copper centre; a free bloomer; old.

29. *Mrs. W. J. Grant* or *Belle Seibrecht.*—Bright rosy pink, very large, beautifully formed; sweetly perfumed. One of the best new roses.

30. *The Bride.*—White, sometimes creamy, of exquisite form, and a splendid rose. One of the best.

31. *Etoile de Leon.*—Sulphur yellow. An excellent rose.

NOISETTES.

1. *Celine Forrister.*—Deep canary and pale yellow, well formed and very fragrant: a rambling grower. (Raised by André Leroy.)

2. *Lamarque.*—Pale creamy white, very large and full: splendid.

3. *Solfaterre* or *Augusta.*—Bright sulphur, large and not quite full.

4. *Madame Caroline Kuster.*—Bright orange red, large and full. A good rose.

5. *Marechal Niel.**—A superb rose of a rich yellow, petals large and smooth, of fine substance, flowers very large and fine. (The great fortune of raising so fine a rose was that of Pardel: but it was sent out by E. Verdier.)
6. *Grossherzog Ernst Ludwig.*—The red Marechal Niel and identical with it, but red.
7. *Alister Stella Grey.*—Pale yellow with orange centre, changing to white. Small, and produced in clusters.
8. *M. Ideal.*—Coppery rose, reflexed with metallic tints of copper and gold.

HYBRID TEA-SCENTED ROSES.

1. *Chest Hybrid.**—Purplish maroon, shaded with crimson: an excellent climber.
2. *Duchess of Westminster.**—Flowers large and full: finely formed, of a cerise color: a good rose. (Raised by Bennett.)
3. *Michael Saunders.*—Flowers very large and of fine form, very full, bronzy pink, very sweet-scented; a good new rose. (Raised by Bennett.)
4. *Vicountess Falmouth.*—Delicate pinkish rose, the reverse of petals bright pink: highly scented; a fine rose. (Raised by Bennett.)
5. *Aurora.**—Sent out in 1898. Salmon pink, large, full and of beautiful shape. A good exhibition flower and free flowering.
6. *Bessie Brown.*—Sent out in 1898. Gold medal, National Rose Society. Color creamy white and of lovely form.
7. *Tennyson.**—Sent out in 1899. Pearly white, shaded flesh and pale pink. Distinct and of fine form.

MOSS ROSES.

(For Hill-stations.)

These roses flower well in the hills, and I have had no difficulty with them planted out in open beds. The moss, however, on them is much reduced.

Summer flowering varieties in England.

1. *Celina.*—Bright crimson, cupped and double.
2. *Eugénie Verdier.*—Bright red with deeper centre.
3. *Frederick Soulié.**—Crimson shaded with purple, a fine rose: one of the best.
4. *Gloire de Mousseuses.**—Pale rose, large and fine: one of the best moss roses.
5. *Lanei.*—Bright rosy crimson: large.
6. *Marie de Blois.*—Bright rose with very mossy buds.
7. *Reine Blanche.*—Pure white, large and double.
8. *White Bath.*—White, sometimes striped, very mossy.

CHINA ROSES.

1. *Archduke Charles.*—Rose, changing to crimson, large and full.
2. *Eugene Beauharnais.*—Amaranth, large, full and free flowering: a good rose.
3. *Ciamoise Superieure.*—Bright rich crimson, with substantial reflex petals.
4. *Mrs. Bosanquet.**—Delicate waxy pale flesh color, very beautiful: one of the best.
5. *Queen Mab.*—Soft rosy apricot, centre of flower orange. Pretty coloring. A prolific bloomer, sent out in 1896.
6. *Cora.*—Sent out in 1898. Bright yellow, tinted with rose.

HYBRID CHINA ROSES.†

1. *Blairii No. 2.**—Bright rose color, very fragrant.
2. *Catherine Bonnard.*—Bright vivid rose color.

BOURBON ROSES.

1 *Acidalie.*—White, tinted with blush, large and full: an excellent rose.
2. *Baron Gonella.**—Bright cerise, shaded rosy bronze, large, cupped and well formed: superb.
3. *Baronne de Noirmont.*—Bright rose, full and finely formed.
4. *Catherine Guillot.*—Fine rosy carmine, large and full: of good form.
5. *Sir Joseph Paxton.**—Bright rose, shaded with crimson.
6. *Louise Odier.*—Bright pink, cupped, full and excellent form.
7. *Model de Perfection.*—Pale satin pink, large and exquisitely formed.
8. *Souvenir de la Malmaison.*—Clear flesh, very large and full: magnificent.
9. *Mrs. Paul.*—Blush white with peach shading, large open flowers: best on cut backs. New.
10. *Kronprinzessin Victoria.*—A novelty, being a white *Souvenir de Malmaison.* The base of the petals are yellow.
11. *Malmaison Rouge.*—A deep red sport of *Souvenir de la Malmaison.*

HYBRID BOURBON ROSES.

(THESE ARE FOR HILL-STATIONS ONLY.)

1. *Charles Lawson.**—Intensely brilliant, shaded rosy red, very large, full and magnificent.

† These do best in hill-stations.

2. *Coupe de Hebe.*—Rosy flesh, large cupped, full and good.
3. *Juno.*—Pale rose, globular, very large and full.
4. *Paul Perras.*—Blush rose; very large, showy: an excellent variety.
5. *Paul Ricaut.*—Brilliant carmine, very large, excellent form and splendid.

MOSS ROSES.

(For Hill-stations.)

Roses that flower in Autumn in England and would do well.

1. *Deuil de Paul Fontaine.*—Deep purple crimson, large and full, a fine rose: new.
2. *Madame Edouard Ory.*—Bright rosy pink, very large and full, a free flowerer.
3. *Madame Landeau.*—Bright red, striped with white.
4. *Madame William Paul.*—Bright rose, large, full cupped and superb.
5. *Perpetual White.*—White, blooming in clusters, very mossy.
6. *Blanche Moreau.*—Pure white, large and full, of fine form.
7. *Celina.*—Bright crimson.
8. *Little Gem.*—Crimson, very double. A miniature rose.
9. *Gloire de Mousseuses.*—Pale rose, very large and vigorous.

CABBAGE OR PROVÈNCE ROSES.

(For Hill-stations only.)

1. *Common Cabbage Rose.*—Rosy blush, globular, large, very full: a very fine old rose.
2. *Crested.*—Pale rosy pink, with buds curiously crested.
3. *Unique* or *White Provènce.*—Pure white, very double, an excellent old rose.

DAMASK ROSES.

(SUITED TO HILL-STATIONS ONLY.)

1. *La Ville de Bruxelles.*—Bright rose, margined with blush, large cupped and highly scented.
2. *Madame Hardy.*—Pure white, large and cupped.
3. *Madame Zoutman.*—Palest flesh color, shape perfect.
4. *Sermiramis.*—Fine rose, fawn-colored centre.

YELLOW ROSES AND BRIARS.

(SUITED ONLY TO THE HILL-STATIONS.)

1. *Austrian Copper Yellow.*—Reddish copper color on inner and outer, and deep yellow on inside of petals; showy.
2. *Hardi.*—Bright yellow, but single, with dark spots at base of petals, single, dwarf and pretty.
3. *Harrisonii.*—Bright yellow, cupped and beautiful.
4. *Yellow Persian.*—Clear deep yellow, very double, the most splendid of yellow roses: foliage sweet-scented.
5. *William's Yellow.*—Fine pure yellow, full and excellent.

ROSES SPECIALLY ADAPTED TO TOWNS

Certain roses can stand the atmosphere of smoke of towns, while others cannot endure it; therefore a special list is appended to suit such places. Not to say that others may not suit the neighbourhood of towns, but the annexed is what may be considered a select list. The descriptions are abbreviated, as most of the roses have been mentioned in the former pages.

1. *Alfred Colomb.*—Crimson scarlet.
2. *Anna Alexieff.*—Light rose.
3. *Barronne Rothschild.*—Clear pale rose.
4. *Barronne Prevost.*—Light rose.

5. *Beauty of Waltham.*—Light crimson.
6. *Charles Lefebre.*—Deep crimson scarlet.
7. *Comte de Nanteuiel.*—Pale flesh.
8 *Comtesse d'Oxford.*—Bright carmine.
9. *Comtesse de Jacourt.*—Flesh color.
10. *Docteur Andry.*—Dark bright red.
11. *Duke of Edinburgh.*—Brilliant crimson scarlet.
12. *Duchesse de Morny.*—Deep rose.
13. *Dupuy Jamaian.*—Bright cerise.
14. *Elizabeth Vignreon.*—Bright carmine.
15. *Elie Morel.*—Lilac rose.
16. *Eugene Appert.*—Velvety crimson.
17. *Felix Genero.*—Violet rose.
18. *Firebrand.*—Dark maroon, red centre.
19. *Fisher Holmes.*—Red scarlet.
20. *François Treyve.*—Crimson scarlet.
21. *François Lacharme.*—Bright carmine.
22. *General Jacqueminot.*—Crimson scarlet.
23. *Gloire de Dijon.*—Salmon yellow.
24. *La France.*—Rosy peach and flesh white.
25. *Tom Mills.*—Rosy carmine. Large.
26. *Madame Charles Wood.*—Crimson.
27. *Madame Clemence Joigneau.*—Rose.
28. *Madame Domage.*—Rose
29. *Madame Victor Verdier.*—Crimson scarlet.
30. *Mlle. Therese Levet.*—Pink.
31. *Mlle. Eugene Verdier.*—Light rose.
32. *Pavillion de Pregny.*—A pretty, small rose: purplish rose inside, white outside.
33. *Paul Neron.*—Bright rose, very large.
34. *President Thiers.*—Scarlet.
35. *Prince Camille de Rohan.*—A dark crimson.

36. *Princess Beatrice.*—Light salmon rose.
37. *Senateur Vaisse.*—Crimson scarlet.
38. *Vicomtesse de Vezins.*—Deep red.
39. *Victor Verdier.*—Rose carmine.
40. *Devoniensis.*—Cream color.
41. *Belle Lyonaise.*—Yellow.
42. *Daune Desprez.*—Yellowish red : a strong grower.
43. *Jean Pernet.*—Yellow.
44. *Aimée Vibert.*—White.

NEW ROSES OF UNQUESTIONABLE MERIT.

Roses that have gained the highest awards of merit, first-class certificates at the largest Show in England, and gold and silver medals up to 1898 :—

HYBRID PERPETUALS AND OTHERS.

1. *Merrie England.*—Rosy crimson, distinctly striped silvery blush ; large. Award of merit, Royal Horticultural Society.
2. *Mrs. Rumsey.*—A fixed sport of *Mrs. Geo. Dickson*, lovely rose pink, of large size. Award of merit and many certificates.
3. *T. B. Haywood.*—Crimson scarlet, well built, of perfect form.
4. *Bruce Findlay.*—Intensely light crimson, beautifully shaped flowers, very free bloomer.
5. *Earl of Dufferin.*—Flowers large, of perfect symmetry, and of delightful color, rich brilliant velvety crimson, shaded maroon.
6. *Etoile de Lyon.*—Sulphur yellow, large and fine; one of the best.
7. *Lady Helen Stewart.*—Flowers large, full, of most perfect form and very highly perfumed ; color bright crimson scarlet; flowers profusely. Flowers of medium size, or rather small.

8. *Margaret Dickson.*—Color white, with pale flesh centre, petals very large, shell shape, and of immense substance: magnificent form: growth very vigorous. Awarded medal of the National Rose Society and six first-class certificates. Best white Hybrid Perpetual at Crystal Palace and at Windsor, 1894.

9. *Marchioness of Dufferin.*—A worthy partner to Earl of Dufferin, which is admittedly the best dark rose produced since 1869. This grand rose is of enormous size, the color is rosy pink, suffused with yellow at base of petals, which is reflexed: vigorous in growth, and a first rate rose. Awarded four first-class certificates and gold medal of National Rose Society. This rose and *Margaret Dickson* I have found to mildew in the hills, but this may be due to the soil in my garden.

10. *Marchioness of Lorne.*—Award of merit from the Horticultural Society. This beautiful rose, dedicated by special permission to Her Royal Highness the Princess Louise Marchioness of Lorne, produces flowers of an exceedingly rich and fulgent rose color, slightly shaded in the centre with vivid carmine. They are large, very sweet, full, and of finely cupped shape: petals large and buds long and handsome. It is specially remarkable for its truly "perpetual" habit, every shoot being crowned with a flower bud.

11. *Marie Daumann.*—Rich carmine crimson, flowers large and of exquisite color, perfectly formed; one of the best roses. Best Hybrid Perpetual and best crimson rose at Crystal Palace Show, 1894.

12. *Mrs. Harkness.*—First-class certificate, 1893. Color pure blush, delicate and clear, at times almost white: a light *Mrs. John Laing*. The flowers are large, of globular form, with massive petals, possessing a peculiar delicious musk fragrance; growth vigorous.

13. *Mrs. John Laing.*—This is undoubtedly one of the finest new roses. The flowers are soft pink in color, large, finely shaped, and exceedingly fragrant. Best light rose at Crystal Palace, 1894. A good rose, late and early, either in the hills or plains. What I would call a good all-rounder.

14. *Salamander.*—Flowers bright scarlet crimson; large and full, outer petals finely reflexed and centre petals standing well up; of fine substance. Exceedingly free in blooming, of fine foliage and habit, strong, and constitution good. A brilliant and most effective rose; quite first-rate. The gold medal rose of the National Rose Society, 1891.

15. *Sappho.*—Buds fawn color, suffused with rose, the opening flowers shaded with yellow: large and full, globular. This very distinct and handsome rose is of vigorous growth, good habit, and is exceedingly hardy; it produces its blooms with extraordinary profusion even for a tea rose: the petals are large and of great substance; no variety holds its flowers so long in good condition, both on the plant and when cut. Two first class certificates. Does better on the plains than hills, where it does not open well, except in a good warm soil.

16. *Sir Rowland Hill.*—Rich deep port wine color, with violet shading, changing to claret: very large, good shape and free. A sport from *Charles*

Lefebre. A splendid dark rose. Gold medal, National Rose Society.

17. *The Bride.*—An exquisitely lovely rose. A very fine white sport from *Catherine Mermet*, free flowerer, and in every way good. Premier Rose at National Rose Show, 1893, and best Tea, 1894.

18. *The Queen.*—A pure white sport from *Souvenir d'un Ami* of American origin. Awarded two first-class certificates. It has all the good qualities of its original, in addition to which it is of more robust habit, the foliage of a dark glossy green.

19. *Empress Alexandra of Russia* (Tea).—Rich lake red, shaded with orange and fiery crimson: very large, full and globular: vigorous growth: quite distinct, both in color and habit, from any rose hitherto introduced. In bud this rose is of a much lighter color.

20. *Belle Siebrecht* or *Mrs. W. J. Grant.*—Bright rosy pink: large, full and beautifully formed, sweetly perfumed and very floriferous: originally exhibited under the name of Mrs. W. J. Grant. Gold Medal, National Rose Society.

21. *Kaiserin Augusta Victoria.*—Pure white, creamy centre; a very free effective variety, good for exhibition: like a large Devoniensis. A splendid rose. One of the best Hybrid tea-scented roses.

22. *Helen Keller.*—Rosy cerise, large shell-shaped petals, of great substance and full flowers: a good show rose.

23. *Marquise Litta* (Hybrid Tea).—Carmine rose, with vermilion centre, very fine.

24. *Mrs. R. G. Sherman Crawford.*—Deep rosy outer petals, shaded pale flesh, base of petals white very fine. Gold medal rose.

25. *Media* (Tea).—Lemon, canary centre, medium size.

26. *Corinna.*—Flesh, shaded rose and flushed copper: large, full and of good form: exceedingly attractive. Award of merit, Royal Horticultural Society.
27. *Sylph* (Tea).—Ivory white, shaded peach and pink, large, full and finely formed.
28. *Charlotte Guillemot.*—A lovely ivory white, with sometimes a slight blush shade in its centre. Large, of fine form, and very sweetly scented. Very pretty. Hybrid Tea.
29. *Souvenir de Madame Eugene Verdier.*—White shaded with yellow, sometimes deep yellow, in its centre. Large and full. A fine rosé.
30. *Souvenir de President Carnot.*—Light rose, suffused white, long buds on long stiff foot-stalks. Large and finely formed. One of the best Hybrid Teas.
31. *Antoine Revoir* (Hybrid Tea).—Rose flesh, edged carmine, base of petals yellow. Large and full. Imbricated.
32. *W. F. Bennett.*—Crimson. Large, double, finely formed, and very sweetly scented.
33. *Ards Rover.*—A climbing or pillar rose of vigorous growth with large flowers, color crimson, shaded maroon.
34. *Watham Standard.*—Flowers brilliant carmine, shaded scarlet. Plant of vigorous growth. Hybrid Perpetual.
35. *Haileybury.*—A lovely contour, color cerise crimson. Vigorous and free flowering.

LORD PENZANCE'S HYBRID SWEET BRIARS

Are very beautiful. It is a matter of question if they will do in the plains, though they do without question in the hills. They have lovely flowers, and foliage scented in the same way as the old sweet briar, which gives these hybrids a special value. I am now growing some of these, and will be able to say more about them shortly.

There are *Amy Robsart*, deep rose. *Anne of Gierstein*, blush. Anthers golden add a charm. *Flora M'Ivor*, pure white, a gem. *Jeanie Deans*, semi-double, scarlet-crimson, in clusters. *Lady Penzance*, soft tint of copper with a metallic lustre; base of petals bright yellow; foliage and flower highly scented. Shoots pendulous. *Lord Penzance*, soft écru or fawn passing to a lovely emerald, yellow in the centre: a good grower and bloomer. Very sweet-scented. *Lucy Bertram*, fine deep crimson, the richest color of all: centre pure white, and golden anthers; an autumnal bloomer. *Meg Merrilees*, gorgeous crimson: free flowering, seeds abundantly. Large foliage. One of the best. *Rose Bradwardie*, clear rose, one of the best and freest, and very robust; and the others I have not mentioned.

These roses should not be pruned, but allowed to grow and ramble at their will.

NEW NOISETTE ROSE OF UNQUESTIONABLE MERIT.

Alister Stella Gray grows to a very good height in one year, and will produce large clusters of small white flowers, with an orange centre, and will meet a long-felt want. A really useful yellow cluster-rose. It flowers almost continuously in the hills. Award of merit, Royal Horticultural Society. A beauty, though small-flowered.

NEW POLYANTHA ROSES OF UNQUESTIONABLE MERIT.

Turner's Crimson Rambler.—Of very vigorous growth, making shoot of 8 to 10 feet in a season, with green grassy foliage and splendid heads or trusses of pyramidal form of bright crimson color, the blooms remaining on the plant for a great length of time without falling or losing their brightness. The National Rose Society's gold medal, as well as numerous first class certificates, have been awarded this rose. A beauty of the highest standard. The roses

are small, in large bunches, and clothe the plant in a mass of crimson. I must not forget to mention *Aglaia*, a new climbing rose with lovely yellow flowers in clusters, which are very large, the centres of the flowers a much deeper buffy yellow: it flowers in great profusion in the hills; and also *Thalia*, a very sweetly-scented white, very double flower. These two grow on my porch, and are beautiful in April and May. The former is not so double as *Thalia*, but both have their peculiar charm. These do well in the hills, but I am not sure if they will do equally well in the plains. However, they are well worth trying

Before closing on the subject of new roses, I must just add a word or two regarding a rose for which I have a weakness, namely, *William Allan Richardson*, a Noisette, of which the flowers are fine orange yellow; *full flowers*, if properly cultivated (the italics are mine); and also this plant must have a situation that suits it. It requires a rich soil. I advise you to grow it against a wall, to which train it through wires nailed across the wall on the north-east side of your house or out-house. The colors of this rose are indescribably beautiful. The deep orange centre at times seems to be lit up with vermilion. Even the outside of this rose seems to be kissed by the sun at times, and blushes. But much depends on the position this rose is placed in. If too much exposed to the sun, the flowers are small and ragged, and petals badly formed, a poor contrast indeed to what it should be. Most of these new roses can be obtained from Mr. C. G. Ollenbach, Dehra Dun, North-West Provinces, and the Government Botanical Gardens, Saharanpur, North-West Provinces.

ROSA POLYANTHA.

Dwarf Japanese many-flowered roses.

1. *Anna Maria de Montravel.*—White, double and fragrant; sweet-scented.
2. *Cecil Brunner.*—Pink.

3. *Etoile d'or.*—Citron yellow, centre paler.
4. *George Pernet.*—Yellowish rose.
5. *Gloire des Polyantha.*—Bright rose with white centre, often flecked white. Flowers abundantly.
6. *Little Dot.*—Pink, flecked carmine on outer petals.
7. *Mignonette.*—A very pretty miniature rose. Rose-pink.
8. *Ma-parquerette.*—Very dwarf, with pure white flowers. Flowers most abundantly and continuously. Excellent for decorative purposes.
9. *Perle d'or.*—Nankeen yellow, with orange centre. Vigorous, branching, and producing flowers in clusters.
10 & 11. *Red-pet* and *White-pet.*—The former, when open, maroon; in bud dark crimson; and the latter white continuous flowerers. Valuable for bouquets and also as pot plants.
12. *Souvenir L'Elise Chatelard.*—Carmine red.

CLIMBING ROSES—TEA-SCENTED.

For covering trellises, bowers, etc.

1. *Belle Lyonnaise.*—Deep canary yellow, with large flowers. Seedling from *Gloire de Dijon.*
2. *Cheshunt Hybrid.*—Cherry carmine. Fine large flowers, full, and of good form.
3. *Climbing Capt. Christy.*
4. *Climbing Devoniensis.*
5. *Kaiserin Augusta Victoria.*
6. *Climbing La France.*
7. *Climbing Niphetos.*
8. *Climbing Perle des Jardins.*

Exactly like their original types in color.

9. *Duchesse d'Auerstadt.*—Bright yellow, but nankeen yellow centre.

These and *Marechal Niel* should give a good choice to those who want to cover bowers, arches and trellises: but the *Marechal Niel* does not grow so vigorously in the hills at high elevations.

ROUPELLIA.—*(Cream fruit tree.)*

Nat. ord., Apocynaceæ.

R. Grata.—So called from its agreeable scent. The corolla of the flower is white, tinged purple color. It is delightfully scented, and is borne in dense sessile cymes. It is a very large shrub and requires to be well cut in to keep it within bounds. Its young stems are of a reddish brown, and its leaves nearly a foot long, oblong-elliptic pointed, and rather leathery, with red petioles. Propagated by cuttings in the rains.

RUDBECIA.

Nat. ord., Compositæ.

Rudbecia are not agreeable-looking plants; are grown for their single Aster-looking flowers. They grow unsightly if kept over from year to year, and are better sown annually.

R. Grandiflora, ray florets yellow, disk dark purple. *R. Maxima*, ray florets yellow, disk elongated. *R. Pinnata*, light yellow ray florets, large and drooping, scented aniseed when bruised. *R. Speciosa*, flowers 2½ to 4 inches across, orange-colored, with purple disk.

RUSSELIA.—*(Shrub.)*

Nat. ord., Scrophularinæ.

R. Juncea.—An exceedingly pretty shrub, which flowers all the year round, with bright scarlet tube-like flowers half an inch long, which are borne in great profusion on what Firminger aptly calls "long rush-like stems." In England it is not uncommonly grown in suspended baskets, and it may be grown in a like manner in this country, with a small vase filled with water above it, from which a syphon of cloth

hangs down to the plant, which will keep it constantly moist and in a healthy condition. *R. Floribunda* bears flowers very like the preceding, but smaller, and which are of a crimson scarlet color.

Both varieties are propagated by division most readily; and the plants being extremely hardy, grow in any ordinary garden soil.

SALIX.

Nat. ord., Salicineæ.

S. Babylonica or Weeping Willow is the species generally met with in India, and requires little description, as every one knows it. There are several other species which grow in India; but none of sufficient merit to grow in a garden.

The Weeping Willow lives but a short life in the hills, owing to a borer which penetrates the timber and soon kills it.

SALPIGLOSSIS.—*(Shrub. Annual.)*

Nat. ord., Scrophularinæ.

A beautiful flowering plant which grows to about two feet in height and bears thimble-like flowers, with a tongue-like style in the corolla. The flowers are beautifully pencilled and velvety. The seeds should be sown in October in the plains, and also in October in the hills, and kept over in the latter places to spring, when they will flower. They require generous treatment and must be transplanted. *Salpiglossis Sinuata* bears flowers of various colors. *S. Sulphurea:* yellow flowers. *S. Nana cærulea:* blue flowers. *S. Violacea:* violet flowers, and *S. Coccinea:* scarlet flowers.

SNOWDROP OR GALANTHUS.—*(Bulbous plant; pot or bedding plant. For Hill-stations.)*

Nat. ord., Amaryllidaceæ.

Most exquisite, valuable little flower plants, as they bloom so early, and may be grown indoors, or in rows with

Crocuses, when they are very effective. They grow however best, and bloom best, when planted out, as they require all the cold they can get in this country, even in the hills. The best time to plant them is in October, not later than November. The following are good varieties. Select large roots both of double and single varieties for indoor culture. *Sir J. Franklin* (very large flowers); *Victoria Regina*, *Mrs. B. Stowe*, *La plus Belle*, *David Rizzio*, *Charles Dickens*, *Wilhelmine*, *Bride of Albion*, *Blucher*, *Aletta*, *Cloth of Silver*, *Bride of Lammermoor*, *Argent*, *Sir Walter Scott*, *Caroline Chisholm*, *Lord Raglan*, *Passelonto*, *Prince of Wales*, *General Todtleben*. These will all be found to be excellent varieties of both single and double sorts.

SALVIA.—*(Perennial Shrub.)*

Nat. ord., Labiatæ.

Salvias are without exception all handsome shrubs, which bear flowers of various colors, and are propagated most readily from cuttings or seed. They do not all endure the climate of the plains well, but with care, and the protection of a plant-house or conservatory, will be found to give satisfaction. If they are wanted to grow tall, train them up a trellis; but should they be desired to grow as shrubby plants, peg down the stems as they grow, and when they afterwards throw up erect shoots, pinch off the tops, or peg them down again. The blue varieties are of smaller growth than the scarlet and red varieties, which grow to six or seven feet in height. Cuttings will not always bloom the first year in the plains. They must not be allowed to stand in a strong sun, and it is better to shade them from 9 A.M. to 5 P.M. during the hot weather, in the plains especially. *S. Saponica:* dark blue and dark red foliage. *S. Augustifolia:* blue. *S. Patens:* beautiful blue (but a delicate plant in the plains). *S. Candelabrum:* dark violet, spotted white. *S. Chronantha:* white. *S. Splendens*, *S. Cardinalis*, *S. Fulgens* and *S. Rœmeriana* are scarlet varieties (the last mentioned has most brilliant scarlet

flowers and grows well in the plains.) *S. Albo Caerulia:* corolla white, lip indigo blue, is a lovely species. *S. Asperata:* white. *S. Boliviana:* calyx green and purple, corolla and lip bluish violet, golden dotted. Many other fine species are almost unknown to the public of India, and which need our attention.

SANCHEZIA.

Nat. ord., Ancylogyne.

Noble large-leaved plants, which are very handsome. *S. Longiflora:* tubular flowers, 2 inches long, rich vinous purple, leaves ovate-oblong, stems four-angled. *S. Nobilis:* flowers cylindrical, slightly curved: bracts bright red, each pair containing 8 to 10 flowers of a yellow color. Leaves 3 to 9 inches long, oblong-ovate. *S. N. Glaucophylla:* this variety, sometimes called *Variegata*, has shining green leaves, striped white and yellow, and is very handsome for its foliage, and *S. Nobilis* is exceedingly so, for its flowers as well as for its foliage.

SANDERSONIA AURANTIACA.

Nat. ord., Liliaceæ.

A monotypic genus. A very pretty, tuberous-rooted, erect-growing herb, bearing orange-colored flowers. A native of the Cape. The flowers are showy, axillary, borne singly, being globose, slightly inflated with a six-cleft mouth. They should be treated similarly to *Gloriosa Superba*, and are difficult to grow, like most Cape bulbs, and in this respect unlike *Gloriosa Superba*.

SANSEVERIA.—*(Bow String Hemp.)*

Nat. ord., Hamodoraceæ.

These are natives of South Africa and the East Indies. They bear long tubular flowers, which hardly expand at the apex to any great degree, and are therefore not very ornamental. The fibre, however, is valuable as a hemp. The plants are somewhat like Aloe plants. *S. Cylindrica:* flowers whitish, on a scape 1½ feet high. Leaves arcuate-cylindrical, 3 to 4 feet long, 1 inch thick. *S. Guniensis:* flowers white

and greenish brown. Leaves reddish at the margins and spotted white. *S. Longiflora:* flowers 3 to 4 inches long, greenish-white; leaves 1 to 2 feet long, 3 to 4 inches broad, spotted white, red-margined, not thick. *S. Zeylanica:* flowers 1¼ to 1½ inches long, greenish-white, in a raceme 1 foot long; scape 1 foot high. Leaves deeply channelled, green with white markings, and margins red-lined. Propagated by suckers. It grows easily in almost any soil.

SANTALUM.—*(Sandal wood.)*

Nat. ord., Santalaceæ.

These trees have no particular merit to admit of their being grown in the garden. *S. Album* is the tree that produces the sandal wood of India. *S. A. Myrtifolium:* a small tree with narrower leaves, which are whitish below. *S. Obtusifolium:* a slender Australian shrub.

SAPONARIA.—*(Annual and perennial shrub.)*

Nat. ord., Silenaceæ or Caryophyllaceæ.

Most effective little plants, which flower in great profusion and are of low growth: adapted particularly for edgings. They may also be grown in beds or ribbons. *S. Officinalis* and *S. Ocymoides* are perennial varieties. *S. Calabrica* is an annual. Sow the seeds of both varieties in boxes or pots in October, in the plains, and transplant them when strong enough.

S. Calabrica: rich deep pink (hardy annual; ½ foot).

S. Calabrica rosea: rose (½ foot; hardy annual).

S. Calabrica alba: pure white (½ foot; hardy annual).

S. Ocymoides: rose pink ¼ foot; hardy perennial). (Basil-like).

S. Officinalis: pale pink (½ foot; hardy perennial. Bouncing Bet common Soapworth).

The flowers resemble Plox. The perennial varieties may be propagated by division of the roots.

SAXAFRAGE.

Nat. ord., Saxifragaceæ.

This is a large genus of plants, all of them, I may say, quite unsuited to being cultivated in the plains. In the hills they do well.

S. Cotyledon, leaves whitish and toothed at the sides, flowers white. *S. Crassifolia*, leaves close to the ground. Pink flowers. *S. Granatum*, flowers white, in great quantity, known as Fair Maid of France or Medow Saxafrage. *S. Hosti*, greyish-green leaves and pink flowers. *S. Oppositifolia*, very pretty. Brilliant little plant with bright purple flowers. *S. Sarmantosa*, with lovely leaves, reddish below and green with white veins above. Flowers in pyramidal form. Petals unequal, the three small ones above spotted with yellow at the base, the others pure white. *S. Peltata*, leaves shield-shaped, flowers pink, requires some shade and leaf-mould in the compost. *S. Longifolia*, leaves linear or narrow in a rosette, and flowers white, dotted red. *S. Umbrosa* (known as London Pride) flowers later in the season than other Saxafrages mentioned above, with white flowers dotted pink. All these are lovely rock plants for the hills. About the best that can be used for that purpose, which grow with little care in almost any soil, except *Peltata*, which requires a rich compost in which leaf-mould is one of the largest component parts.

SCABIOSA.

Nat. ord., Dipsaceæ.

A biennial, generally treated as an annual, as it does not outlive the rains in India in the plains. *S. Autropurpurea*, or Devil's Bit, bears heads of dark purple flowers. *S. Dichotoma*, a biennial, best suited to the hills. There are several varieties of this, of various colors of flowers. Put down the seed in a rich compost in the plains in October and November, and in the hills in October, and transplant in spring, or plant the seed in March.

SCHIZANTHUS.

Nat. ord., Scrophulaceæ.

Annuals which bear flowers which are small, but in great profusion. Very pretty in the hills, but less so in the plains, as they have barely time to yield their flowers before the hot weather kills them. *S. Grahami*, red and orange. *S. Pinnatus*, purple with red spots. *S. Retusus*, red and yellow. Sow the seeds in the hills in October, and keep protected in winter. Not to be transplanted. In the plains sow in September or October, where the plants are to remain. They do not bear transplanting well.

SCHISMATOGLOTTIS.

Nat. ord., Aroideæ.

A genus of about fifteen species, which are rhizomatous plants, the leaves springing from the rhizomes, being somewhat long, heart-shaped, often marbled or spotted. Petioles sheathing or clasping at the base. They require a moist atmosphere and lots of water and shade. A rich sandy loam which incorporates a good deal of leaf-mould with good drainage at the bottom suits it. Propagated by division during the rains.

S. Crispata: flower spathe green, at the base creamy white. Leaves cordate, oblong, dark green above, with greyish band in centre, and greyish down the veins. *S. Pulchea:* glaucous-green and spotted silver-green. *S. Variegata:* leaves oblong-lanceolate, obtuse at the base, narrow and long at the apex, dark green with a broad silvery central band beneath. *S. Longispatha:* flowers curious in structure. Leaves obliquely ovate, about 4 inches long, light green with a feathered central band of silver grey, the midrib distinct green. *S. Lavallei*, *S. L. Immaculata*, *S. L. Purpurea*, *S. Neoquieensis:* leaves deeply cordate at the base, upper surface bright green, irregularly marked with large pale yellowish-green blotches. *S. Picta*, *S. Rupestris*, *S. Siamensis.*

SCHIZOPETALON WALKERI.

Nat. ord., Cruciferæ.

A most elegant little annual plant, with white almond-scented flowers, particularly in the morning. In the evening the flowers close. Flowers white and purple, of different shades at the same time. Sow seed in the plains in good rich compost, where the plants have to remain, in September or October, and in the hills in October, and protect during winter.

SCHIZOSTYLIS COCCINEA.—*(For the hills only.)*

Nat. ord., Iridaceæ.

Flowers that are quite hardy. The rhizomes may be planted at any time in the border or in pots, preferably in the former. They bear spikes of flowers much like *Ixias*, but deep scarlet. The soil they are grown in should be of a light sandy nature manured with leaf-mould.

SCILLA.—*(For the hills only.)*

Nat. ord., Liliaceæ.

These bulbous plants only do in the hills, and should be planted in October in the open border, in a light soil which incorporates a good deal of leaf-mould. The spot planted should be covered over in winter with a little straw as protection against weather. *S. Bifolia*, flowers azure blue, 6 to 10 in number. *S. Campanulata*, flowers numerous, usually light blue. *S. Cernua*, light blue, sweet scented. *S. Maratima*, more a foliage plant than for its flowers. *S. Peruviana*, very handsome flowers, in a large, dense, flattish cone-shaped head. Plant the bulbs 4 to 6 inches deep. It is known as the Cuban Lily. The bulbs should be taken up after withholding water, when the plants have done flowering, and have dried off, and should be stored away in some dryish soil in a pot, but not allowed to get dust dry.

SCINDAPSUS.

See *Pothos.*

SECURIDACA.

Nat. ord., Polygalaceæ.

S. Virgata; a large prostrate shrub if left unsupported, of which the leaves are 1½ to 2 inches long, those of the flowering branches smaller. Flowers variegated, odorous and borne in profusion; corolla yellow, wings rosy outside, white within: racemes terminal, drooping. A pretty shrub: grows readily in any soil. *S. Erecta,* red flowers in dense panicled racemes. *S. Brownei* and *S. Scandens* are mentioned in Firminger as being in botanical gardens, and he continues: "I have not seen them in blossom."

SELAGINELLA.—*(Moss.)*

Nat. ord., Lycopodiaceæ.

These are truly a vast genus (upwards of 300 species) of mosses, and comprise the great ornaments of the grass conservatories. Many of these grow in pans of water, others do well on rockeries. Their cultivation is attended by no difficulty if grown in light soil (which should be open) mixed with charcoal or potsherd. They are splendid for rockeries, soon covering them with a carpeting of lovely green. Planted at the beginning of the rains, they give no trouble, and start well into growth very shortly, resting in winter and starting into growth again in spring.

The above remarks apply to the plains and hills equally.

The best varieties are *S. Atroviridis, S. Canaliculata, S. Caulescens, S. Cuspidata, S. Denticulata, S. Erythropus, S. Grandis, S. Hamatodes, S. Involvens variegata, S. Kraussiana, S. Lævigata, S. Lepidophylla, S. Martensii, S. Poulteri, S. Tasselata, S. Uncinata, S. Wallichii, S. Willdenovii.* These are all of the best species. *S. Lavigata* is common in Calcutta, and is well known by the metallic sheen on the plant, which makes it attractive *S. Sepeus* is a moss greatly used for covering rockeries.

SELENIPEDIUM.

Nat. ord., Orchideæ.

For general culture see *Cyprepedium.* This having been omitted among Orchids is entered here. The best species are *S. Ainsworhii, S. Calurum,* a large, showy and free-flowering hybrid, *S. Caricinum, S. Caudatum, S. Dominianum, S. Grande,* large, *S. Lindeni, S. Roezlii, S. Schlimii, S. Schröderæ; S. Sedeni.* Their general appearance is much like *Cyprepediums;* some one or two of them, however, such as *S. Schlimii,* are of difficult culture. They should have plenty of water, much more than the *Cyprepediums.* The drainage should be perfect. They should be potted in peat, turfy loam a small quantity, and sand, and should be kept cooler than plants of their class.

SEMPERVIVUM.—*(For the hills.)*

Nat. ord., Crassulaceæ.

These are not suitable to the plains, but will do in the hills. In places suitable to them in the hills they will grow in almost any soil. They are much like *Echeverias,* with thick fleshy leaves in rosettes, and are useful as edgings to rockeries. *S. Californicum, S. Tectorum* and *S. Tabulaeforme* are good examples of them. There are many species of *Sempervivum,* but space only admits of my mentioning a few.

SENECIO.

Nat. ord., Compositæ.

S. Elegans is a pretty little plant, very bushy, and grows to 1 or 2 feet high: by cultivation it has produced several interesting varieties. Their colors are very good, ranging from white to dark violet, and flower profusely till destroyed by frost. In the plains sow in October and treat as annuals. In the hills sow in April or May, and take cuttings in autumn and protect during winter. The plants are effective *en masse* planted at 2 feet apart. *S. Pulcher,* a species from Natal with rich purple flowers, should be treated in the same way.

SERICOGRAPHIS.

Nat. ord., Acanthaceæ.

These grow well in grass conservatories. *S. Ghiesbreghtiana* bears scarlet flowers in terminal panicles. Leaves bright green, smooth, ovate-lanceolate. Grow in a rich light soil. Height 1½ to 2 feet. Propagate by cuttings during the rains. This is a handsome shrub and deserves to be better known.

SERISSA FOETIDA.

Nat. ord., Rubiaceæ.

A pretty little shrub, with bright green shining leaves, small, ovate-acuminate. Plant about 2 feet high, bearing small double white flowers at almost all seasons, which, when rubbed, have a nasty odour.

SILENE.—*(Catchfly.)*

Nat. ord., Caryophylleæ.

A very large genus, many species being annual, biennial and perennial. *S. Pendula* is best known to us, an annual bearing rosy pink flowers, which are very numerous. Sow in the hills in October, and keep till spring under cover from frost, or sow in February and March, to flower in autumn. In the plains sow in October and November. It does well in a good rich soil in a sunny position. *S. Compacta*, a handsome biennial species, only suited to the hills. *S. Hookeri*, a handsome perennial, flowers pale pink, 2 to 2½ inches in diameter.

SIMONISIA.—*(Syn. Beloperone.)*

Nat. ord., Acanthaceæ.

Very handsome ever-green shrubs allied to *Justicea*. Not many of these have been introduced to India. *S. Oblongata* bears rosy-purple flowers in axillary spikes. Leaves oblong-lanceolate. *S. Chrysophlœa* bears purple flowers. Leaves golden or yellowish-green. *S. Violacea*, flowers violet. Leaves lanceolate, pointed and entire. Propagated by cuttings during the rains. Thrives in the grass conservatories on the plains.

SINNINGIA.—*(Suited to the hills.)*

Nat. ord., Gesneraceæ.

Plants with the appearance of *Gloxina* (tuberous rhizomes) and must be cultivated in the same way. *S. Concinna*, flowers purple above, yellow beneath, spotted within. *S. Conspicua*, yellow, marked purple within. Leaves one foot. *S. Speciosa*, flowers violet. Leaves velvety, very large. A great many of these have been known under the popular name *Gloxinia*.

SIPHOCAMPYLOS.

Nat. ord., Campanulaceæ.

Very pretty glabrous, hairy or tomentose shrubs, little known to India yet. Some of them are suited to the plains, and all would do in the hills. They are grown in a light turfy loam and peat in England. Propagated by cuttings.

S. Betulaefolius, flowers red; requires heat. *S. Coccineus*, flowers scarlet; requires cool treatment. *S. Glaudulosum*, rose-colored flowers, requires heat. *S. Humboltianus*, scarlet flowers: requires heat. *S. Manettæflorus*, red and yellow flowers, requires heat. These are the best species, and should have been introduced to India.

SIPHONANTHA.—*(Syn. Clerodendron*, which see.)

SKIMMIA.

Nat. ord., Rutaceæ.

These are pretty shrubs, Laurel-like, with highly-polished or glabrous smooth leaves, with green branchlets. Flowers whitish, clustering in terminal panicles which are branched, followed by berries of ovoid form, fleshy and two to four-stoned. Natives of the Himalayas and Japan. Some of them may do in the grass conservatories, and all thrive in the hills. *S. Fragrans*, flowers white, fragrant. Leaves elliptic-oblong and thick, leathery. Height 3 feet. *S. Japonica*, flowers white like the Hollies, highly scented, in panicles of many

flowers. *S. J. Variegata*, like the last mentioned species, of which it is a variety, but with pretty leaves bordered broadly and unequally with white. *S. Laureola*, a native of Nepaul. A very pretty citron-scented shrub (syn. *Limonia Laureola*), with pale yellow very fragrant flowers in compact corymbs (rachis and peduncle dotted purple). Fruit smooth, ovate, and about the size of an olive. Leaves oblong-lanceolate, pointed, and attenuated at the base, dark green above, yellowish beneath; 3 inches to 5 inches long. Height of plant 4 feet. *S. Oblata*, fruit bright vermilion, oblate, glossy. A very pretty Japan species. *S. Rubella*, flowers in erect panicles, which are terminal. Buds tinted red. Flowers greenish white, very fragrant. Leaves leathery, lanceolate-elliptic. A Chinese species. Propagated by seed and cuttings.

SMILAX.—*(Tribe Smilaceæ.)*

Nat. ord., Liliaceæ.

This genus embraces, according to one authority, 187 species, but only a few of these are eligible for our gardens. Some of them being highly ornamental are desirable. To this tribe of plants belongs Sarsaparilla, which is known botanically as *Smilax longifolia*. Their leaves are, as Firminger says, "like the Sweet-potato." Most of them are creepers, and those with ornamental and variegated leaves are grown for their foliage. A sandy loam is suited to them. *S. Macrophylla Maculata*, or *S. Variegata*, may be seen in some gardens: leaves spotted. *S. Ornata* is a much handsomer species: leaves deep-green, cordate and beautifully spotted profusely between the veins with a silver-grey color. Petioles prickly at the back; branches angular, armed with prickles. A handsome species.

SOLANDRA.

Nat. ord., Solanaceæ.

Climbing shrubs, natives chiefly of tropical America They are very handsome when properly grown. If allowed

too much room, they grow, but do not flower well, so they should be grown in pots according to their size, or in a space lined with slates. Propagated by cuttings taken from flowering shoots in the rains. *S. Grandiflora;* peach-colored trumpet flower; calyx 2 to 3½ inches long, three or four cleft; corolla whitish, 7 to 10 inches long; flower like a trumpet in form. The fruit greenish, sweet, sub-acid in flavour. Leaves broadly elliptic-oblong, 2½ to 5 inches. *S. Viridiflora:* flowers greenish. (*Dyssochroma Viridiflora* is now the proper name of this plant.) *S. Oppositifolia:* flowers much like *Grandifolia;* leaves large, yellowish-green, glossy.

SOLANUM.

Nat. ord., Solanaceæ.

An immense genus, of which only a few ornamental species can be admitted in the garden. They are easily grown. The best species are comparatively new to India. *S. Argenteum*, *S. Auriculatum* and *S. Coriaceum* are erect shrubs, not needing much comment, with bluish flowers. *S. Jasminoides* is a nice creeper, quite jasmine-like. Leaves small, 2 to 2½ inches long. Flowers scented, waxy-white, in clusters of about 10 flowers each, 1 to 1¼ inches long. A variety, *Folis variegatis*, has leaves blotched with creamy white. *S. Wendlandii* is comparatively new. Flowers lilac-blue, in clusters from the ends of the branches, which last a long time in perfection. Flowers 2 inches across or more, the bunches 6 inches or more across. Leaves large, 2 to 8 or 10 inches long and 4 inches broad. The plant is a strong climber, and loves sunshine. A light rich soil suits it. Propagated in the warm weather by cuttings put under a bell-glass. *S. Dammannianum* is also a new erect shrub added to our Indian gardens, and I am indebted to Mr. P. Lancaster for a description of what he mentions of this very handsome plant. Its flowers are in size and color like *Wendlandii*, while the leaf is large, 9 to 12 inches long by 6 to 8 inches broad, with large, sharp spines. *S. Capsicastrum* (All Saints' Cherry) is what is common in some

hill-stations. It bears scarlet berries combined with dark green foliage, and is a small shrub about 2 feet high. It is raised by seed or cuttings. During the autumn and winter months its berries are acceptable, when there are few flowers. *S. Havanenis*, an erect shrub; *S. Nervosum*, an erect shrub; *S. Seafortheanum* and *S. Spirale* are all species grown in Calcutta.

SOLIDAGO.—*(Golden Rod.)*

Nat. ord., Compositæ.

S. Canadensis.— A plant well known in Calcutta, with small ray-like florets in ample crowded panicles of a yellow color. *S. Drummondii*, *S. Lanceolata* and *S Speciosa* are handsomer. The latter has larger flower heads, and is a handsome plant, but I do not know of it being introduced to India. Propagated by division.

SOLLYA.—*(Australian Blue Bell Creeper)*

Nat. ord., Pittosporeæ.

S. Heterophylla (or variable-leaved) bears small cymes of 5 to 8 flowers (sometimes 12 flowers) of a fine azure-blue color. This creeper grows to about 6 feet in height, and has variable leaves. *S. Parviflora* (or small-flowered) on fine pedicels.

SONORILA.

Nat. ord., Melastomaceæ.

S. Bensoni.—A nice little plant, with rosy-purple flowers and yellow anthers and hairy raceme. Leaves 2 to 3 inches long; shining polished leaves, slightly toothed, much like *S. Speciosa*. *S. Margaritaceæ* : a charming little pot plant, with rose-colored flowers 8 to 10 in a corymb, "generally surrounded at the base by a whorl of sub-sessile leaves" The leaves of this plant are opposite, oblong pointed, dark glossy green above, with white spots arranged in series of lines between the veins, which are oblique and parallel, and darker than the leaf.

Stems rather procumbent, rich scarlet. Variety *Argentea* has leaves surfaced with silver grey, and variety *Marmorata* banded with silver grey. Native of Assam and Sylhet.

SOPHORA.

Nat. ord., Leguminosæ.

S. Tomentose.—A pretty, rather large shrub, with pinnate foliage of 11 to 17 leaflets, oblong and coriaceous, glossy above. Flowers Laburnum-like, showy, in long racemes.

S. Violacea (Firminger says "Indigo-like"), violet flowers. The Japanese Pagoda Tree, *S. Japonica-pendula*, is exceedingly pretty, willow-like, drooping, with whitish small flowers in loosely branching panicles, terminal, large. Its leaves are very graceful, bluish-green and pinnate Leaflets 11 to 13 in number, oblong-ovate, acute. The young wood is green A truly lovely tree of the weeping class. Known sometimes by its synonym *Styphnolobium Japonicum*. I do not know if this tree has been introduced to India. *S. Tetraptera* is another handsome species from New Zealand: flowers yellow, 1 to 2 inches long, 4 to 18 flowered, four-winged. Wings linear-oblong. Racemes axillary and pendulous.

SPARAXIS.—*(Bulbs.)*

Nat. ord., Irideæ.

These are lovely little bulbous plants, which do well in the plains or hills. I think it best to put down the bulbs either in the plains or hills in October. In the hills protect them during winter. Dealing with them thus they flower best, as the plants are stronger. A good rich light soil suits them best, manured with leaf-mould. When in bud, or just before they come into bud, water with liquid manure, and the flowers will be better and more plentiful. There are several varieties. *S. Angelique, Delicata, Garabaldi, Josephine, Lady Carey, Leopard, Liliago, Maculosa, Magnifica, Nain, Pendula, Prince of Orange, Pulcherrima, Pulcherrima alba, Atro-purpurea,*

Purpurea, Queen Victoria, Reflexa, Thunbergii, Tricolor Alba, Tricolor Grandiflora, Victor Emanuel, Viridiflora and *Trichonema Grandiflora.*

SPARTEUM.—*Syn. Spartianthus (Spanish Broom.)*

Nat. ord., Leguminosæ.

S. Junceum.—Rush, or Spanish Broom, bears yellow fragrant flowers, which are showy and borne in terminal racemes. Broom or rush-like, it seldom has leaves. This is a very ornamental plant, the twigs of which, if macerated, yield a good fibre. With care it outlives the hot season in the plains. Propagated by cutting. It grows more easily in the hills, but when young requires to be sheltered from the heavy rains.

SPATHELIA.—*(Maypole or Mountain Pride.)*

Nat. ord., Simarubeæ.

S. Simplex is a handsome shrub or tree, which bears red flowers in a powdery panicle several feet long. The leaves are variable, and it is as a foliage plant that it is grown. The stem is slender, like that of a palm. Propagated by ripened cuttings inserted in sand placed under a hand-glass.

SPATHIPHYLLUM.

Nat. ord., Araceæ.

Though these plants are of the natural order *Araceæ*, they have leaves in many respects unlike that order of plants, and are sagittate, or arrow-shaped. They derive their name from *Spathe*, a spathe, and *phyllon*, a leaf, which refers to the leaf-like spathe. They are natives of tropical America, and two are Malayan species. The following have been imported to India. *S. Bensonii*, *S. Hybridum*, spathe whitish on both sides; *S. Pictum*, leaves glossy, dark green, mottled with blotches of golden green, much like a *Dieffenbachia* (the proper name of this plant is *Rhodospatha picta*). Other good species are *S. Candidum* (syn. *Anthurium candidum*), *S. Cannaefolium* (syns. *S. Cannaeforme*, *Anthurium Dechardi*). Propagated by division of the roots, and sometimes by seed.

SPECULARIA.—*(Venus looking-glass, annual.)*

Nat. ord., Campanulaceæ.

An annual not seen much now, which was once an old favourite. The plant called *S. Speculum* bears purple flowers; *S. Pentagonia*, blue flowers; *S. Hybrida*, flowers with a blue corolla within, and lilac outside. This is known as the corn violet. *S. Perfoliata* is the true Venus looking-glass and bears purplish-blue flowers. Sow the seed in the border, where it has got to remain, in the hills in March and April, and in the plains in September, October and November.

SPHENOOGYNE.

Nat. ord., Compositæ.

S. Speciosa.—A handsome annual, native of Calafornia, useful for massing, the flowers being of an attractive color, sulphur-yellow with a purple centre. Sown in the hills in autumn, they require protection during winter, and flower early in spring. In the plains sow in September or October and plant out in beds. The flowers are in form like a single *Chrysanthemum.*

SPIGELIA MARILANDICA.—*(Indian Pink, for the hills.)*

Nat. ord., Loginaceæ.

S. Marilandica.—A perennial with funnel-shaped flowers, red outside and yellow within, nearly two inches in length, standing in groups on stems one foot in height.

It thrives best in shade on rockwork or among ferns. Propagated by division of the roots in spring. This is unsuitable to the plains.

SPILANTHES.

Nat. ord., Compositæ.

Mostly annuals, though some are perennials. *S. Oleracea* (Para Cress), an annual with button-like flowers, yellow, with a spot in the centre of dark brown. I do not think

these of much merit as ornaments, though they are curious. Sow the seeds in July in the plains, and in the hills in spring, and plant out in the border.

SPIRAEA.—*(Meadow Sweet.)*

Nat. ord., Rosaceæ.

Probably so called in allusion to its fitness to being wound into garlands, from the Greek word *spirea*, to wind. Roots of various species of *Spiraea* are imported by seedsmen in this country. The Himalayan Seeds Stores, Mussoorie, N.-W. P., generally keep them in stock. The roots should be put down in spring in the hills, and early in September in the plains, as also in October and November, when they soon show signs of growth. A soil rich in leaf-mould suits them. They have flowers in dense heads, flowers generally individually small, but in great profusion. *Spiraea Japonica* is what is generally imported to India by seedsmen (often called *Hotea Japonica* and *Astilbe Japonica*). Its foliage is elegant, glossy, dark green, and as a pot plant has few rivals among plants we can procure from seedsmen here. Its feathery blooms are purest white. For forcing, it is necessary to get strong clumps and put them down undivided in rich soil. A little spent cow-dung at the bottom of the pot, over the drainage, soon forces them, especially if the pot is plunged in some ashes, or even soil or sand. For rockeries it is well adapted, as also for the border, in partially sheltered and shaded places in the plains. *S. Aruncus* (Goat's Beard) grows to 4 or 5 feet. The flowers are very small, but unite to form a large and elegant spike. It prefers shade. *Spiraea Filipendula flore pleno* is a double flowered species of a British plant, suited more to the hills than the plains, which flowers late in the season in the hills. *Spiraea Palmata* is a lovely plant, much like the common Meadow Sweet, but with bright crimson flowers. Other good species are *S. Cantoniensis*, *S. Douglasii*, *S. Lindleyana*, *S. Prunifolia flore-pleno*, and *S. Ulmaria* (the common Meadow Sweet.)

SPIRONEMA FRAGRANS.

Nat. ord., Commelinaceæ.

So called from its spirally twisted bundles of seed vessels. It thrives in any light soil and bears small white fragrant flowers in dense, head-like panicles. Leaves large, oblong-lanceolate. This plant is more curious than beautiful. Increased by division.

SPREKLIA OR SPREKELIA.—*(Jacobea Lily.)*

Nat. ord., Amaryllideæ.

S. Formosissima.—(Sprekelia, so called after "J. H. Sprekelsen, Hamburg, who wrote on liliaceous plants.") Very handsome Amaryllis-like flowers of a cockade form, of deep velvety crimson. It flowers well both in the plains and hills. In the hills it loses its leaf in the winter, and in the plains does not, unless water is withheld, which should be done by degrees, and it should thus have an artificial period of rest. There is a white variety of this, *S. Dalhousicæ*, which is rarer, and has broader leaves. *S. Cybister (Tumbler Sprekelia).* The flowers of this are reflexed and borne four on a scape, and are reddish, while those of *Formosissima* are one on a scape. Frequently the flowers of *Cybister* appear before the leaf, and its leaves are reddish towards the base. Culture the same as Amaryllis.

STACHYTARPHETA.

Nat ord., Verbeneacea.

Named from *stachys*, a spike, and *tarphys*, thick, in allusion to the form of inflorescence. *S. Mutabilis* bears crimson-rosy flowers, which are large, verbena-like, on a spike two feet or more long almost all the year round. Leaves oval or oblong, serrated and tapering at the base, rough above and (pubescent) or downy beneath. The plant has a coarse appearance. Syn. *Verbena Mutabilis.*

S. Jamaicensis, Brazilian Tea-tree, has little pretensions to recommend it in its small blue flowers in long spikes and smooth leaves, as also *S. Orubica*, with leaves veined and crimped. Flowers violet-colored. Propagated by seed.

STAPELIA.—*(Carrion flower.)*

Nat. ord., Asclepiadeæ.

There are several species of the above plant grown in Calcutta, and they all grow well in the Upper Provinces and North-West Provinces of India, and with proper protection in hill-stations. Their flowers are star-like and very curious and beautiful, mostly of a brownish color, more or less veined. If bruised, they emit a most unpleasant odour. They are succulent plants, and are easily propagated in dry weather by letting the cutting dry at the base, when they strike readily in sandy soil. Some varieties have quite golden and silver veins, which sparkle in the sun like gems. They require a sandy soil thoroughly drained by using brick rubbish among it. In winter or cold weather they should have little water. The plants are almost Cactus-like, but are not armed with thorns. To be found in the A. and H. S. Gardens, Calcutta. *S. Gigantea*, flowers pale-yellow with brownish-red lines and with red round the corona: of a very large size, 12 inches to 14 inches in diameter. *S. Laevis*, flowers green beneath, purple above, yellowish at apex, dotted red (syn. *Caruncularia Pedunculata*). *S. Maculosa*, flowers smooth, dirty yellow, red at the tips and edges; covered with reddish spots of fantastic form, very fœtid. Other good species are *S. Grandiflora*, flowers large, flat, purple covered with grey hairs and striped white. Peduncles three-flowered. Plant quite grey from the hairy stems, which are 4-cleft, cactus-like and toothed. *S. Sororia*,* vinous-purple, wrinkled; the folds at the base being bright orange-yellow. Plant 6 to 10 inches high. This is perhaps the best species. *S. Curtisii*, yellow with blood-colored dottings. *S. Patentirostris*, * dark purple-brown wrinkled with transverse lines of yellow; centre very hairy, with rich purplish hairs.

STAPHYLEA.—*(Bladder nut tree.)*

Nat ord., Sapindaceæ.

These are only suitable to the hills, if protected from heavy rain, and I do not think would suit the plains. *S. Colchica*, plant about 3 to 5 feet, a native of the Caucasus. Leaves ternate and pinnate, five-fold, 4 to 5 inches long. Leaflets ovate-oblong, pointed, toothed, and hairy or downy. "*S. Pinnata* (Job's tears: St. Anthony's nut), flowers in racemes: nuts white, pistachio-flavoured, in a bladder capsule; leaves pinnate, of five to seven oblong, glabrous, serrated leaflets. Height 6 to 12 feet."

STATICE. *(Sea-lavender.) (Syn. Taxanthema.)*

Nat. ord., Plumbagineæ.

Statice incana—Is a perennial species, which may be obtained from seed sown in October both in the hills and plains, but is generally got by division of the roots. The seed may be got from seedsmen in England, but is seldom got from seedsmen in this country. It is a remarkably pretty plant. The leaves form a rosette on the ground, from which the flower bearing stems are produced, 1½ to 2 feet high. The flowers are pink, in rather dense heads. *S Superba* has feathered or plumed spikes of flowers, cockscomb-like, white to rose color, in height 18 to 24 inches, in many plumes, and is a good species, which may be obtained in seed from seedsmen in this country; and also *S. Suworowi*, more or less like the above, but lilac colored. Sow the above two species in September and October in the plains and in March and April in the hills. *S. Elata*,* white. *S. Callicoma*,* pink. *S. Floribunda*,* violet-blue. *S. Tartarica*.*

STEPANOPHYSUM.

Nat. ord., Acanthaceæ.

S. Baikiei.—A herbaceous plant bearing heads of many flowers of a scarlet color almost at all seasons, about 2 inches long, of a tubular shape, inflated at the middle and gaping at

the mouth, which are very pretty. *S. Herbstii:* leaves dull green, the upper ones purplish, 5 to 6 inches long, 1¾ to 2 inches broad, lanceolate-pointed and serrated or toothed. An erect shrub bearing red-purple flowers three to five in number, 3 inches long, of which the limb is white. *S. Longifolia:* flowers vermilion-colored. Leaves oblong-lanceolate, pointed at both ends, toothed. About 2 to 3 feet high. A pretty plant. *S. Repens:* scarlet flowers, 1½ inches long, tubular, wide at apex. A pretty plant. *S. Portellæ:* rose pink, hairy externally, about 1½ inches long, tubular, slender, dilated about the middle, and a flat limb about 1 inch in diameter. These are propagated by cuttings taken during the rains.

STEPHANOTIS.—*(Syn. Jasminanthes. Creeping tube rose.)* *Nat. ord., Asclepiadæ.*

S. Floribunda is a choice, beautiful and ever popular creeper, well known and cultivated in India. Its foliage is waxy, thick and shining green, oval in form. Its flowers are of the purest white, very fragrant and borne freely in large bunches of most exquisite waxy, tubular form. Sometimes it bears a fruit or seed-pod much like a large oblong plum. The drainage should be carefully attended to in the pots these plants are grown in, or they sometimes die off suddenly in the rains. The compost should be light and manured with leaf-mould chiefly. These plants may be propagated by cuttings put down in sand, covered with a hand-glass in the rains. When they become well rooted, by March, they may be transferred to separate pots (or in beds in the plains), trained to a trellis, when they begin to grow as the spring sets in in the plains.

They require a sheltered position, not too sunny. In the hills they cannot be grown in open beds, as they require the protection of a conservatory or glazed verandah in the winter months.

They may be propagated from a single leaf with its leaf-stalk. Varieties *Elvaston* and *Profusa* are much like

Florabunda. *Thonarsii* is not so floriferous, bearing only three flowers in a bunch.

STERCULIA.

Nat. ord., Sterculiaceæ.

These are trees, generally too large for most gardens; but are, as trees, ornamental. *S. Colorata, S. Fœtida, S. Fulgens, S. Heterophylla, S. Platanifolia* (Chinese Parasol), plain-leaved, very smooth, cordate and divided into five lobes, each of which terminates in an acute point. A very ornamental tree. *S. Urens.* Propagated by seed in the rains.

STEVENSONIA.

Nat. ord., Palmæ.

S. Grandifolia.—An exceedingly handsome palm, one of the handsomest cultivated. The lower flowering spathes of this palm are 1¼ feet long, the upper ones club-shaped and smooth, 2 to 3½ feet long. The fruit is orange-red, ⅓rd to ⅜ths of an inch long Spadix 3 feet to 6 feet long. This palm is stemless, and from its base start the stalks, which are coppery and armed with black spines, more so when young. The leaves, when young, are a cinnamon-brown color. This palm succeeds well in grass conservatories in the plains in a moist atmosphere. It is best grown in turfy-loam, sand and leaf-mould. Propagated from imported seed.

STIGMAPHYLLON.

Nat. ord., Malpighiaceæ.

Climbing shrubs or creepers. *S. Littorale,* a rather pretty, tall, climbing plant, with flowers ½ to 1½ inches long, and clawed petals 1 inch in diameter. Many flowered, yellow, in corymbs which are terminal or at the ends of the shoots. Leaves 2 to 5 inches long, varying in shape. *S. Ciliatum* (Golden Vine), flowers large, golden, 3 to 6 in an umbel, with fringed petals, with long claws. A tall climber. Propagated by layers.

STRELITZIA.—*(Bird of Paradise flower.)*

(Bird tongue flower.)

Nat. ord., Scitamineæ.

Flowers large and showy, on short pedicels. Leaves in long stalked sheaths. Propagated by seed obtained by impregnating the stigma, *S. Augusta*, flowers whitish, not of much interest.

S. Reginæ.—Orange and purple flowers in numbers. Leaves rather short, strap-like, on top of a long leaf stem. More peculiar and showy than pretty.

STREPTOCARPUS.

Nat. ord., Gesneraceæ.

Very pretty gesnerous plants, which do very well in the North-West Provinces and hills. *S. Polyantha* has but one or two large leaves, 1 foot long, lying flat on the ground, the leaves opposite to them being small, barely 2 inches long. Leaves cordate, oblong, wrinkled and downy. Flowers pale blue, 1½ inches long, tube curved upwards, and lobes toothed. Scapes 1 foot or more high. The flowers are borne in panicles. *S. Saundersii* has only one leaf, 1 foot long by 8 inches broad, very velvety, cordate, obtuse, coarsely serrated, yellowish green above, purplish-rose below, very downy beneath. Flowers pale blue, drooping, funnel-shaped, tube broad and nearly straight. *S. Rexii*, bluish. New hybrids have appeared of a variety of colors and greatly improved in size. It is a bulbous plant, worthy of attention, and may be procured in seed, which sow in the hills in October or March and April. All here mentioned are perennials. *S. Dunnii* is also a handsome species. Flowers 1½ inches long, drooping, rose color, with a bright red tinge; between tubular and funnel shaped, with the lobes rounded; scapes 6 to 8, one foot high, bearing many branched panicles of flowers. Leaves much crisped, lying flat on the ground, ovate-oblong.

STROBILANTHES.

Nat. ord., Acanthaceæ.

Strobilanthes, from *strobilos*, a cone, in allusion to the cone shape of the flowers when young. *S. Auricularis*, a small plant, bearing heads of pale lilac flowers in profusion. Pretty when in flower, but rather a coarse-looking plant.

S. Sabinianus, flowers lavender-colored. Leaves pointed at both ends, large, deep green, 2 to 4 inches long; under-surface reddish-purple. *S. Scaber*, a pretty plant or shrub, with yellow flowers. *S. Dyerianus*, a pretty shrub, with purple leaves.

Propagated by cuttings put down in light soil (such also as they grow best in) in the warm and rainy seasons.

STYLOCORYNE.—*(Syn. Randia.)*

Nat. ord., Rubiaceæ.

S. Weberi.—A shrub, bearing *Ixora*-like corymbs of flowers, which are very fragrant, of a greenish-white color. Leaves polished green, leathery, lanceolate, 3½ to 4 inches long. Thrives best in shade. Propagated by cutting in the cold season in the plains.

SUN FLOWER.

See *Helianthus*, page 340.

SUTHERLANDIA.

Nat. ord., Leguminosæ.

S. Frutescens.—A small shrub, not unlike *Clianthus Damperi*, with bright red or scarlet flowers, but smaller, which are very handsome, in axillary racemes. The seed is borne in an inflated, papery, many-seeded pod. They do not bear flowers in the plains, according to Firminger (probably in Bengal), though the plants outlive the hot season and rains. I have not had any experience of this plant, but I think it would flower in the North-West Provinces. Propagated by seed or by cuttings.

SWAINSONA.

Nat. ord., Leguminosæ.

S. Galegifolia.—A pretty herbaceous plant, of which there are several forms, with flowers pink, rose-colored, white, purple and bright-red: rather large, pea-like, in racemes. The plants are twining, Indigo-like. Perennial. Sometimes climbing to several feet, but generally 2 feet high.

S. Greyana (Darling River poison pea).—Flowers pink, large, in erect racemes; calyx cottony white; stems erect; 2 to 3 feet. Perennial. Readily propagated from seed or by cuttings. Plants require protection during the rains.

SWEET PEA.

See *Lathyrus*, page 372.

SWEET SULTAN.

See *Centaurea Moschata*, page 186.

SWIETENIA.

Nat. ord., Meliaceæ.

S. Macrophylla and *S. Mahagoni* (the Mahogany tree) are both very handsome trees, too large for ordinary private gardens. There are some large trees to be seen in Calcutta and Barrackpur of these. Propagated by seed.

SYRINGA.—*(Lilac tree.)*

Nat. ord., Oleaceæ.

Syringa, or Lilac tree, will not succeed in the plains. In the hills I have raised it, and seen it raised from seed, as also *Laburnum*, but I think it should be kept for two years at least in pots till the plants are strong enough to bear the rains, which invariably kills them. *Laburnum* has thus succeeded, but if planted out the first year, die during the rains, and I think the same should apply to *Syringas*. The best species are *S. Emodi*, *S. Josikaea* (scentless), *S. Vulgaris* (common lilac), *S. V. Alba* (common white lilac), *S. Alba*

grandiflora Charles X (deep purplish lilac), *Ranunculiflora* (double, dark red, turning lilac), *Renoncule* (double, azure mauve, highly scented). The last four are garden varieties, of which there are many.

TABEBUIA.

Nat. ord., Bignoniaceæ.

T. Chrysantha.—Much like a Bignonia: in fact it has been called *Bignonia Chrysantha* wrongly. Its flowers are golden-colored, 2 inches long. This is a small tree or shrub.

T Smithiana: yellowish orange. Propagated by ings in the rains. *T. Spectabilis:* this too has been *Bignonia Spectabilis* and *Tecoma Spectabilis*, being so like *Bignonias* and *Tecomas.*

TABERNAEMONTANA.

Nat. ord., Apocynaceæ.

These are very handsome shrubs and common in our Indian gardens: especially *T. Coronaria flore pleno*, which has fine dark green, glossy, smooth, rather leathery leaves, 4 to 5 inches long, lanceolate, opposite, and has slightly scented white flowers, which are double, large and smooth, of good substance. *T. Dichotoma* is another common though handsome shrub, which takes up much room, and is often seen from 6 to 10 feet in height. It has rigid, broad, lanceolate leaves of a yellowish-green, large and smooth. The flowers are scattered, single, and, as Firminger remarks, like *Vinca Alba*. *T. Recurva* has fragrant flowers, 2½ inches across, during the hot season, in great profusion, and has leaves narrow, lanceolate, wavy and smooth, of a deep green color. This is a handsome shrub. *T. Densiflora*, syn. *Rauwolfia densiflora*, *T. Amigdalifolia*, *T. Citrifolia*, *T. Wallichiana*, *T. Longiflora* are all species of little merit. There is a species, *T. Barteri*, but I have not seen it. All the above Tabernaemontana are propagated by cuttings put down in the rains.

TACCA.

Nat. ord., Taccaceæ.

These are not much known in India yet. They are perennial herbs with creeping or tuberous rhizomes, natives of China, with hermophrodite flowers in dense umbels at the end of a scape, which is leafless. Flowers brown, lurid or green, and fruit narrowing off much at the base, thicker towards the apex, which is pointed, elongated and six-ribbed. Leaves large, petiolate, undivided and entire, sometimes lobed. This order is divided into two genera, Schizocapsa and Tacca, and includes about 10 species. *T. Cristata*, flowers purplish-brown, numerous, in an umbel. Leaves lanceolate-oblong, with long channelled cylindrical petioles. Height 1½ to 2 feet. *T. Integrifolia*, flowers green, purple and yellow. Leaves shining green, recurved, 8 to 16 inches long. *T. Pennatifida*, flowers purple, funnel-shaped. Propagated by division. They should be grown in a well-drained light soil.

TACSONIA.—*(For the hills only.)*

Nat. ord., Passifloreæ.

These plants do not succeed in the plains; in the hills they are quite hardy and grow in almost any good soil, with little care, and are cultivated in the same manner as passion flowers. *T. Insignis*, leaves 5 to 7 inches long, lanceolate-oblong or pointed, toothed. Flowers 6 to 8 inches in diameter, violet-crimson, petals darker crimson than the other parts of the flower, corona mottled blue.

T. Manicata.—Vivid scarlet, corona double.

T. Mollissima.—Pink flowered.

T. Van-Volxemii.—Scarlet, very showy. Propagated from seed, layering and grafting.

The above are very showy and handsome flowers.

TAGETES.—*(French and African Marygold. Annuals.)*

Nat. ord., Compositæ.

T. Erecta or *African Marygolds* are well-known, free flowering, and most showy annuals, of rich and beautiful

colors; very effective planted in beds, borders or ribbons. Sow the seeds in July, August, and September in the plains, and in July and August and spring, in May, in hill-stations. *T. Patula*, or French Marigold seeds, may be sown at the same season. The plants of the latter variety are more dwarf, and their flowers more varied in color than those of the African description. They are used as a foreground to the latter plants, and the new orange and brown miniature French varieties make splendid compact edgings to beds or borders. Sow the seeds in pots, and transplant them when strong enough to handle.

GOOD VARIETIES OF AFRICAN MARIGOLD. *(Tagetes Erecta.)*

Elderado.—Very large and beautifully quilled.

Fistulosa.—Lemon. Prince of Orange.

GOOD VARIETIES OF FRENCH MARIGOLD *(Tagetes Patula.)*

Select prize Gold-striped, Sulphurea, Brunea, Pulchra, Cloth of Gold, Queen of Dwarfs.

TALAUMA.

Nat. ord., Magnoliaceæ.

T. Pumila, commonly known as *Magnolia Pumila*, is a handsome shrub, with leaves and flowers like the Magnolia. The flowers are borne at almost all seasons in the plains, and are globular, about the size of a large turkey's egg, of a white or creamy colour, and scented.

T. Candolli (Magnolia Mutabilis) has creamy-white flowers, which are large. The petioles of the young leaves are covered with rufous hair. Propagated by layering, and sometimes by cuttings put down in sand, during the rains.

TAMARIX.—*(Jâu or Pharâs.)*

Nat. ord., Tamariscineæ.

T. Gallica, or the common Tamarisk, is a common jungle shrub, known as *Jâu* or *Pharâs* by natives, and is used for

making baskets; as also *T. Dioica* is a native of this country. Both have feathery casuarina-like foliage and whitish-pink flowers. Both are rather pretty when in bloom.

Propagated by cuttings put down in the rains

TAXUS.—*(The Yew.)*

Nat. ord., Coniferæ.

T. Chinensis is the only species mentioned in any works on Indian gardening as grown in India; but there are several fine species, all of which would grow well on the hills. *Taxus Baccata adpressa, T. B. Donastoni, T. B. Fastigiata, T. B. Fructo luteo.*

TECOMA.—*(The trumpet flower. Shrub and creeping plant.)*

Nat. ord., Bignoniaceæ.

A genus of splendid creepers, with foliage which is either pinnate or bipinnate, with the exception of *T. Apiifolia*, with parsley-like foliage, and *T. Valdiviana*, with lanceolate foliage. The handsomest of all of them is *T. Grandiflora*, with orange flowers, or *T. Jasminiodes*, with rosy-white flowers. *T. Radicans* is also a handsome plant with orange-scarlet flowers in large corymbs. The branches of the last mentioned variety take root whenever they touch the ground. *T. Stans* is a small tree with pinnate foliage and golden-yellow flowers. This plant is easily killed by cold, but may as easily be replaced by fresh plants grown from seed. *T. Chrysantha* (syn. *Tabebuia Chrysantha*) bears orange flowers and is properly *Tabebula Chrysantha*. *T. Diversifolia*, yellowish white flowers, tinged purple. *T. Mollis* bears yellow flowers and is a shrub. *T. Radicans* bears scarlet flowers. *T. Undulata* (syn. *Bignonia Undulata*) bears orange-colored flowers. *T. Valdiviana* also bears orange-colored flowers, villous (hairy) within. Propagation of *T. Grandiflora* and *T. Stans* is by seed, and *T. Radicans* and *T. Jasminiodes* by cuttings and layers.

TECTONA.—*(Teak.)*

Nat. ord., Verbenacea.

T. Grandis, the teak tree. Far too large for most gardens, but very handsome with its large foliage, and spikes of bloom, followed by seed, all of which enhance its beauty.

TEPHROSIA CANDIDA.—*(Shrub.)*

Nat. ord., Leguminosæ.

A beautiful shrub, with pinnate foliage, splendid when in bloom, with its large white blossoms, which Firminger compares to butterflies. This plant has an elegant appearance with its ashy greyish-green foliage underneath the leaves and brilliant green above them. Propagated from seed, which may be sown at almost any season of the year.

TERMINALI.

Nat. ord., Combretaceæ.

Almost all very tall trees, unfitted for the garden. *T. Arjuna* or *Pentaptera arjuna* grows to 60 feet high. *T. Catappa* or the country Almond is a handsome tree, soon grows large, and is grown for its foliage more than for the almond. *T. Tomentosa* is the "*Asan*" tree, known to the natives by that name.

TETRANEMA MEXICANA.—*(Shrub. Pot plant.)*

(Mexican Foxglove.)

Nat. ord., Scrophularinæ.

A pretty little pot plant, which flowers almost all the year round, with primrose-shaped flowers on a many-flowered scape, which are of a purplish-violet color, and borne in umbels. A light soil, enriched with leaf mould and well-drained, suits it best. The plants must not be exposed to wind, rain or sun, or they are sure to be either killed or much injured. They are propagated from seed, which takes a month or two in germinating. Sow the seed according to directions given for Primula, under paper, or a pane of glass, or a hand-glass, to prevent the soil from drying too soon.

THEVETIA.—*(Zurd Kunel of the natives.)*

Nat. ord., Apocynaceæ.

T. Nerifolia.—Leaves much like the Oleander, and flowers tubular, expanding in the centre and at the mouth, followed by nuts of almond shape. A handsome and common plant in Indian gardens. Propagated by seed.

THIBANDIA.

Nat. ord., Vacciniacæ.

T. Setigera.—This is not common in India, though plants of it are to be seen occasionally in some of the gardens. It should be planted near a tree, and its fibrous roots just covered with soil. Its flowers are long, "Heath-like," and leaves much like Thevetia or Oleander, but smaller. Propagated by cuttings.

T. Floribunda, T. Picinchensis are other species. *Floribunda* bears flowers on racemes 2 inches long.

THRINAX.

Nat. ord., Palmæ.

These palms differ much in general appearance. Their flowers are sometimes long and slender, spathes many, papery-coriaceous, cut. Fruit small, pea-like. The genus include some very handsome species. They are propagated from seed, which should be obtained fresh and sown at once. The best of these palms are *T. Barbadensis, T. Glauca, T. Parvifolia, T. Radiata, T. Multiflora.* Others are *T. Argentea*, the Silver Thatch or Broom Palm; *T. Excelsa, T. Pumillo, T. Elegans*, is a synonym of *T. Radiata*, and *T. Gracilis*, a synonym of *Radiata* also; *T. Graminifolia*, syn. *T. Multiflora.*

THUJA.—*(Arbor Vitæ. Shrub.)*

Nat. ord., Coniferæ.

A most ornamental shrub, and a delightful ornament to the garden. There are many varieties of it, all of which may be propagated from seed. *T. Gigantea, T. Occidentalis,*

T. Ebivangeriana are good species. *T. Aurea* is a new introduction of value. *T. Orentalis* is the common species, which is handsome.

THUMBERGIA.—*(Creeper.)*

Nat. ord., Acanthaceæ.

Very pretty little climbing plants, which require a trellis, or they may be grown in hanging baskets or vases. Almost all the varieties are common in India. Sow the seeds in October in the plains, and in spring in hill-stations.

T. Alata: buff, with purple throat.

T. Alata Bakeri; purple.

T. Coccinea: scarlet.

T. Alata aurantiaca: orange, with purple eye.

T. Alata alba: white, with purple throat.

T. Grandiflora is a very extensive creeper with large pale blue flowers. Both *Alba* and *Grandiflora* are of the same habit, and their flowers are precisely the same in shape and size These two latter varieties grow wild in many parts of India. *T. Fragrans* bears white flowers at all seasons, and is a small creeper with heart-shaped leaves. *T. Laurifolia* is a large shrub with flowers like *T. Grandiflora*, but has longish pointed leaves 10 inches in length.

TIGRIDIA OR FERRARIA.—*(Tiger Flower. Bulbous plant.)*

Nat. ord, Iridaceæ.

These are plants with most gorgeous flowers and with but little foliage, on which account they are better planted in clumps in the border to hide their naked stems. The bulbs should be put down in October, and require but little attention further than watering them moderately. If the soil is very stiff, mix it with a sprinkling of sand. They are very interesting plants.

T. Canariensis: yellow, with fine scarlet spots.

T. Pringelei; new, tall, like *T. Pavonia.*

T. Undulata : white, spotted black.

T. Cœlestina : greyish lilac, distinct.

T. Conchiflora : yellow and red spotted.

T. Patscuaro : rare white bell-shaped flowers, tipped mahogany.

T. Speciosa : yellow, spotted red.

T. Buccifera : purple-violet, distinct.

They look well in boxes or pots planted in clumps. Withhold water by degrees when they have done flowering, and do not disturb the bulbs, but surface-dress the box in which the bulbs are when they start into growth again the following season. *T. Pavonia* is separate in appearance from the above species, and is common in our Indian gardens. Its leaves are tall. Its flowers are scarlet and spotted orange-yellow. *T. P. Albiflora* is a white-flowered variety, which is rare.

All these do best in the North-West Provinces and hills, but *T. Pavonia* succeeds very well in Bengal. The flowers are very fugitive, and last but one day, except in the case of the last mentioned plant, which stands all weathers, and is best planted in the open beds and left there.

TILLANDSIA.

Nat. ord., Bromeliaceæ.

These are rock-loving plants, which are much like *Bilbergia* in appearance, but they are remarkable for their leaves, which are of various colors. Tied to a block of wood with moss, they grow very well. They may also be cultivated in pots in the same manner as Bilbergia. They are, however, mostly epiphytal in habit, many of them being found in their native habitat on trees. Some of them have been introduced to India, among which—

T. Musaica, which is perhaps the best.

T. Carinata.

T. Duratii.

T. Glaucophylla.
T. Hamuleana.
T. Kingiana.
T. Lindeni.
T. Morreni.
T. Psittacina.
T. Regina, which exhales a strong Jasmine-like perfume.
T. Sandersii.
T. Splendens.
T. Umbellata.
T. Zebrina.
T. Utriculata.
T. Zonata.
T. Fenestratis.
T. Bellula.

TOLPIS.

Nat. ord., Compositæ.

T. Barbata and *T. Macrorhiza.*—Annuals bearing small yellow Aster-like flowers. Sow in the plains in October, in the hills in March.

TORENIA.

Nat. ord., Scrophularineæ.

T. Asiatica.—A very pretty herbaceous pot plant, 6 to 10 inches high, with ovate-lanceolate leaves, bearing bell-formed flowers, corolla blue, 1¼ to 1½ inches long, with dark violet on the lower lobe of very intense color. *T. Fournieri*, calyx ¾ inch long, broadly five-winged corolla, tube pale violet, yellow at back, 1 inch long, bright violet round lobes. *T. Billoni*, syn. *T. Flava*, yellow, with purple eye. Sow in a pot in March both in the hills and plains, and keep the pot in a pan of water. The plants must be kept in shade. They bloom in great profusion and are very pretty. It is best to sow the seed yearly.

TOXICOPHLAEA.—*(Winter Sweet.)*

Nat. ord., Apocynaceæ.

T. Spectabilis : Winter Sweet. A shrub from 4 to 6 feet high, bearing flowers in terminal and axillary corymbs forming very large dense sprays, frequently 2 feet long, of white flowers, with a sweet scent, which is powerful. The leaves are elliptic. They require a light rich soil. Propagated by cuttings in the rains. *T. Thunbergii*, now known as *Acokanthera vernalis*, syn. *T. Cestroides*, bears yellow flowers, tipped brown. Flowers open in the evening or afternoon; corymbs eight-flowered usually. Leaves lanceolate-oblong and coriaceous.

TRADESCANTIA.—*(Spiderworth.)*

Nat. ord., Commelynaceæ.

Tradescantia syn. *Ephemerum*. *T. Discolor* syn. *Rhœa discolor* is a common plant in our Indian gardens, growing to about 2 feet high or more, with pointed leaves, edged with crimson. Flowers small and borne nearly at all times.

T. Virginica is commonly called Spiderworth, or flower of a day: flowers about 1 inch in diameter, packed closely in the bud in two rows, each with a bract at the base, violet or purplish, sometimes whitish. Leaves linear, broadest at the base, purple veined. Propagated by cuttings put down in the rains.

TREVESIA.

Nat. ord., Araliaceæ.

These are handsome foliage plants with palmate or digitate leaves, and are easily cultivated in a compost of sand, loam and leaf-mould. Propagated by cuttings put down in sand. The two following are the best and are more or less like each other: *T. Eminens*, leaves roundish in outline, palmitifidly divided to about two-thirds of their depth, into nine segments, of which the edges are toothed. *T. Palmata*, leaves 2 feet or more, palmate. Segments lobed or pinnatifid.

TRIBULUS.

Nat. ord., Zygophyllaceæ.

Weedy-looking plants of no merit. *T. Languinosus. T. Cistoides* bear bright yellow flowers. The flowers of the first mentioned being sweet-scented.

TRITONIA.—*(The Red-hot-poker plant. Bulbous plant.)*

Nat. ord., Iridaceæ.

These are very handsome plants with immense spikes of flowers, from three to seven feet high, of many colors, closely covered with bloom. Below are the names of some choice varieties :—

T. Avelanche : pure white.

T. Speciosa : orange rose.

T. Rosalis : semi-double flowers; bright-rose.

T. Crocata : a fine salmon-color.

T. Eclair : scarlet.

T. Delicata : white.

T. Pauline : pink, and many others.

They should be treated exactly like Ixias.—(See IXAS.)

In the plains I think these plants will do well. In the hills they require little attention beyond surface-dressing in spring, and occasional transplanting when they have been grown too long in one spot.

TROPÆOLUM.—*(Tuberous-rooted plant. For the hills.)*

Nat. ord., Tropæolaceæ.

All the tender tuberous-rooted Tropæolums are most beautiful plants, graceful climbers in habit, and trained over a globe-shaped trellis are very lovely. Three or four tubers should be placed in a pot, and the compost used should be equal parts of leaf-mould, loam and sand. A new *Tropæolum Phœbe* is delightfully scented. Flowers notched at the edges, flowering all winter and summer. Deep golden yellow, crimson feathered blotch on each segment, outer edges

scolloped. An exquisitely shaped flower. Award of merit, R. H. Society, 1898.

T. Azureum : a splendid azure blue.

T. Tricolorum : yellow, scarlet, and black.

T. Jarritti : scarlet, orange and black.

T. Polophyllum : yellow, in trusses of two feet long.

T. Pentaphyllum : red, limb green, spot purple within.

T. Pentaphyllum : scarlet and green.

T. Peregrinum : canary-bird flower. Elegant fringe-like pale yellow flowers.

T. Albiflorum : white.

T. Cupreum : copper brown

These plants will not succeed in the plains. Water sparingly till the plants have formed roots, and be careful that the pots are well drained. The bulbs should never be disturbed when the plants are growing. Grown over pillars and rafters in a greenhouse they are most ornamental and attractive. They require to be somewhat protected from the heavy rain of the monsoons and extreme cold in winter.

TULIPA.—(TULIP. *Bulbous plant. For hill-stations.) Nat. ord., Tulipaceæ.*

These bulbs cannot be cultivated in the plains with success. They bear splendid flowers, of the most beautiful colors. In hill-stations, the bulbs must be planted in open beds in October or November, and treated just as Hyacinths are—*(See* HYACINTHUS). I have found it best to plant them in beds, and when they send up their flower scape, they must have a tube of paper put over them to draw them up (or a tube of tin is better) : as the flowers may be quite close to the ground and thus lost to view.

Watering with liquid manure, when the flowers begin to appear, aids them considerably in this country.

When they are grown from seed on the continent, they will not show any stripes or markings, all the upright portions

of the petals being self-colored, and they continue unmarked for years, till they at last break out into stripes and markings, and are named, if they then give satisfaction. Before their marks are defined they are called breeders, and in this state have been used for breeding purposes. A peculiarity in them is that, though twenty of a sort be put down in one bed, scarcely two come up alike: but good judges recognise them.

Glenny surmises that this "may be one of the charms of tulip-cultivation:" the charm of uncertainty.

One of the chief points to gain success with Tulips is to put them down well before winter sets in in the hills at the close of October or early in November, then to draw them up by placing a funnel over them when the flower bud shows itself.

The best soil for Tulips is, three inches of the surface soil to be rich old turfy loam, well cleaned of worms and grubs; but it does not matter much what sort of soil is below, if it is of an open nature, well-drained and rich. Protect the roots from frost. Tulips are divided into *Roses*, *Byblomens*, and *Bizarres*.

Roses have a "white ground, and crimson, pink or scarlet markings."

Byblomens have a "white ground, and purple, lilac or black markings."

Bizarres have a "yellow ground, with any colored marks that present themselves."

Self-tulips "are those of one color, with no inclination to other colors."

In beds they may be arranged most advantageously, with respect to color, in geometrical figures. Of the Tulip there are innumerable varieties, and it will be best to leave the selection to the florist from whom they are purchased. There are *Early double Tulips*, *Parrot Tulips*, and *Vanthol Tulips* to choose from.

TUPISTRA.—*(Mallet Flower.)*

Nat. ord., Liliacea.

T. Macrostigma.—Bell-shaped flowers, half an inch across, in a drooping spike 2 to 3 inches long, dark-purple. Leaves lanceolate, leathery or stiff, about 1 foot long, bright-green. Rhizome creeping and much branched. *T. Squalida*, flower bright violet or with the tube greenish, in dense spikes. Leaves oblong-lanceolate, erect, 2 to 3 feet long by 2 to 4 inches broad, narrowed at both ends. Rhizome fleshy. A Himalayan species.

TURNERA.

Nat. ord., Turneraceæ.

T. Trioniflora, syn. *Ulmifolia Elegans*, creamy-white or pale yellow flowers, with purplish eye, borne the year round, but mostly in the cold season in the plains. Leaves oval-lanceolate, of a dull-green, coarsely serrated, 1 foot high. *T. Ulmifolia* (Sage Rose or West Indian Holly): flowers about the size of *Reinwardtia*, dull-yellow, of not much interest, and not worth a place in the garden.

TWEEDIA CÆRULEA.—*(Shrub.)*

Nat. ord., Asclepiadaceæ.

These are herbaceous plants, with downy leaves and light-blue flowers. They must not be exposed to extreme sunshine. They grow in any ordinary garden loam, and require no particular treatment. Propagated by seed.

TYDEA.

Nat. ord., Gesneraceæ.

These plants have both lovely flowers and leaves, and are choice. In the plains these are best grown in a plant-house to be seen in perfection of foliage and flower. For cultivation, see *Gesnera*. There have been many hybrids produced

on the continent, as they hybridise freely. *T. Amabilis*, flowers very hairy (or villous), dark rose. Leaves dull green above, pale green below. *T. Aurantica*, *Lindenii* and *Zebrina*, *T. Picta*. Garden varieties are numerous. Here are four really good novelties: *Nicole*, flowers large, carmine, limb spotted brownish-black on a white ground and washed vermilion; *Niger*, carmine, tube partly carmine and spotted maroon on a white ground, washed rose; *Noe*, carmine, limb striped and spotted purple on a magenta ground; *Norbert*, very large flower, cochineal above and yel low on lower part, limb lined and spotted ochre-red on cream ground.

They are much like *Achimenes*, but have marking on their leaves.

URANIA.

See *Ravenala Madagascarensis*. (Travellers' Tree.)

URGINEA.

Nat. ord., Liliaceæ.

These plants are bulbous, which bear terminal racemes of flower of bell form, rather small, on a scape. Leaves generally long and narrow, linear; sometimes loriform or nearly oblong. *U. Indica* (Indian Squills): flowers white. *U. Maratima* (Sea Onion Squills): whitish, in racemes 1 foot long. Scape 1 to 3 feet. Cultivated in a light soil and propagated by division.

URTICA.

Nat. ord., Urticaceæ.

These are of little horticultural merit. All these belong to the nettle genus of plants.

U. Pulchella, with rather pretty leaves, reticulated or veined above and silvery beneath. A shrub.

U. Saliafolia, with long willow-like leaves, dark green above and whitish below. A small shrub.

UVARIA.

Nat. ord., Anonaceæ.

These bear small flowers that are very fragrant. *U. Longifolia* and *U. Odorata*. The following bear larger flowers: *U. Kurkii*, flowers 3 inches in diameter, dirty straw color and green. The young leaves are of a rusty color, the older leaves having hair scattered over the mid-rib. *U. Zelanica* (Cyngalese), flower 1 inch in diameter. Leaves dark shining green above and red below.

VALLOTA.

Nat. ord., Amaryllideæ.

V Purpurea (or Scarborough Lilly): bears flowers 3 to 4 inches long, several in an umbel, bright-red or scarlet colored, on a scape 2 to 3 feet high, when the bulbs are in full leaf. They are shy in flowering on the plains, but give no trouble in the hills. An occasional watering of liquid manure helps them, and does good in dry weather.

V. P. Eximia, syn. *V. P Major*, is like the above in color and flowers 4 inches across, but has a white throat. The bulbs of the above plants should not be disturbed for years, and they do all the better if the soil is only surface-dressed.

VELLOZIA.

Nat. ord., Amaryllideæ.

V. Elegans.—A small plant, 6 inches high, bearing flowers pale lilac when in bud, then pure white, 1¼ inches across. Leaves recurved, 4 to 8 inches long, linear, pointed, sharply keeled, serrated towards the apex.

V. Candida pure white, very beautiful. A very handsome plant, which I do not know has been introduced. A native of Brazil. A tufted plant with grass-like leaves, which would do well in our grass conservatories, for when growing in England requires stove heat.

V. Retineris, a plant with palm-like stem and a tuft of grass-like leaves on the top.

About 10 to 12 feet high, bearing flowers of a blue color in a dense head at the top of the plant. If this plant is not introduced, I have no doubt it will be before long. A native of the Transvaal and Natal.

V. Squamatum, with a short stem and linear leaves 4 to 6 inches long. Flowers orange-red, tube formed enlarged towards the segments, slightly spreading, on a scape 6 to 8 inches long.

VERBASCUM.—*(Mullein.)*

Nat. ord., Scrophularineæ.

Rather coarse-looking plants, bearing spikes of flowers of rather small or moderate size Of not much horticultural value Raised from seed sown in October and in March or April in the hills. *V. Chaixii* (nettle-leaved Mullein), yellow. *V. Phœniceum*, violet or red.

VERBENA.—*(Prostrate plant.)*

Nat. ord., Verbenaceæ.

These are the most valuable bedding plants; there are numerous named varieties, and new varieties are yearly being brought into notice. They grow without much care in any ordinary garden soil, but being gross feeders, are much benefited by rich soil. In the plains of India, during the hot and dry weather, from March to June, they are liable to die off from excessive heat, therefore the finer varieties especially should be carefully treated by screening, etc.; but after all I consider it the best plan to make cuttings of them, and place them in pots, to be planted out again in the month of June. Cuttings are easily struck in a light soil. Verbenas and all other soft-wooded plants may be struck in water, but I see no advantage gained thus. The usual practice is to cut part of a branch level across, at the base of a couple of leaves; remove the leaves, and place the end in soil, water or damp moss. No soil can be too rich for Verbenas; but that which is best for them is composed of leaf-mould two-thirds, and soil one-third. If the soil is stiff, add a

sprinkling of sand. There are numerous hybrid varieties, striped, marbled, and spotted; also auricula-eyed.

VIOLA.—*(Violet, Heartsease, Pansy.)*
Nat. ord., Violaceæ.

The Pansy is a florists' plant, and therefore only the very best and most select seeds should be used. In the plains they require the greatest care in cultivation, and must be grown in a plant-house, conservatory or glass-house, and shaded from sunshine.

The seed of Pansies should be sown in the plains in October, and in hill localities in October or spring.

The pots in which the seeds are sown should be particularly well-drained, and the compost should consist of leaf-mould, loam and sand. When the seedlings are strong enough, pick them out, and plant them singly in pans adapted to them in size. They are better off being transplanted more than once, and the flower are larger if the plants are not allowed to grow too bushy, one, two or three stems being the limit to which they should be allowed to grow; but if extra large flowers are not so much desired, the plants may be allowed to grow freely, but the tips of the shoots should be pinched to make the plants bushy.

They may be propagated by division, or by cuttings. Some varieties are more robust growing than others. These, to be fitted for exhibition, require a poorer soil.

In hill-stations they may be planted in beds out in the open; when they will require protection from frost and from heavy rain. There are innumerable varieties of self-coloured flowers, with a yellow ground and a white ground, and there are besides fancy flowers. Good varieties are *Lord Beaconsfield, Odier's Pansies blotched, Striped Pansies, Giant Trimardeau, Pansy Cassiers Giant, Burgnot's Giant spotted, English show varieties, Roemer's Exhibition prize. Pansy, new giant varieties, new violet-scented Pansies*; these are not so large, but are perfumed like violets.

VIOLA ODORATA.—*(The Violet. Perennial.)*

Nat. ord., Violaceæ.

Much admired as these little flowers are, and prized to make small bouquets of, they deserve space here, for their delicious scent makes them desirable plants.

There are many varieties, some of which are white, others violet-colored, and others with double flowers. These little plants may be obtained from seed or by division of the roots. Not unfrequently the seed fails.

They should be planted in a rich loamy compost in a shady situation. In pots or boxes I think they do best, that is, if they are well drained. During the rains they are liable to suffer, unless put under the shelter of a shed or verandah; and, after the rains are over, turn them out of their pots, wash their roots free of soil, dip their roots into cow-dung and water, the consistency of thick cream, and plant them out after dividing them in fresh rich compost, which should be quite free from pestilential insects, some of which are very minute and cause the leaf to get curled, or curl the leaf up to live in. The double varieties seem to suffer from the rains, and will with difficulty be kept alive in the plains, but in the hills they live and thrive quite easily. I would advise you to grow them in a compost of cow-dung and loam, not leaf-mould, as I find it often has the effect of attracting insects, especially to the leaves of this plant.

Double White Violets.

Belle de Chatenay, Queen, Comte de Brazza.

Double Blue.

De Parme, Duchess of Edinburgh, King of Violets, Lady Hume Campbell, Marie Louise, Neopolitain, New York.

Mr C. G. Ollenback, of Dehra Dun, and the Himalaya Seed Stores, Mussoorie, have a choice lot of varieties always in stock, and plants can be obtained from them.

Single Violets.

California is a grand new variety. Flowers immense, on stalks 10 inches high. *Prince of Wales* is one of the finest single Violets. Its flowers are more like a Viola than a Violet, and *Princess Beatrice* is something like it. *La France* is a single Violet of large proportions and very fine. The former received an award of merit from the R. H. Society. The only Violet that seems to grow without much care through the rains in the plains is the common Violet of the single variety; but I think with care the better kinds may be saved. They must be kept out of the rain and watered very sparingly.

VERSCHAFFELTIA.

Nat. ord., Palmæ.

This palm, known as *V. Splendida*, is, according to Geo. Nicholson, A.L.S., a monotypic genus which has been known in gardens as *Regetia Magnifica*, and is one of the best and most distinct palms we have in our conservatories. It is also known as *R. Majestica* and *R. Princeps*. Its leaves are 4 to 7 feet long by 3 to 5 feet broad, bright-green, bifid, the edges being deeply cut. Stem 6 to 12 inches in diameter, and as well as the leaf sheaths, and petioles very spiny when young.

VIBURNUM.

Nat. ord., Carpifoliaceæ.

Viburnums are not suited to the plains of India, but in climates such as the hills they grow with little care in almost any soil in good moisture and with shade, and are really lovely plants, with flowers somewhat like a hydrangea, in globose heads.

V. Dilatum, white or rosy.

V. Macrocephalum, white, in large pyramidal cymes.

V. Odoratissimum, scented like *Olea fragrans*, in corymbs 2 to 4 inches high A native of the Kassia hills.

V. Opulus. (Guelder rose. Snow-ball tree). Flowers white, in a globose head 2 to 4 inches in diameter.

VICTORIA REGIA.

Nat. ord, Nymphaeaceæ.

The Queen Victoria Water Lily flourishes in the tanks of Calcutta, the North-West Provinces and Oudh, and is undoubtedly the queen of all water lilies, with immense and most noble leaves 4 to 6½ feet generally floating on the water, with turned-up edges and prickles on the lower side, which is purplish, the upper side being a bright-green. Flowers one foot or more in diameter, rose-colored, and deeper towards the centre. The seeds to retain their vitality must be kept in a bottle of water. Sometimes they do not germinate for a very long period, and have been known to lie dormant for two years and nine months. The plant is said not to live more than two years. They should be planted in a pot and placed in a *gumlah* or tub of water, in full sunlight, as soon as the seed is obtained. When the seedlings appear they should be pricked out and placed in pots singly, shifting gradually to larger pots as the plants increase in size, till large enough to plant out in the large tank they are to occupy permanently.

VINCA.—*(Periwinkle.)*

Nat. ord., Apocynaceæ.

V. Alba, white; *V. Rosea*, rose-colored; and *V. Major*, blue; are all three common though very pretty prostrate plants, which are much alike as regards foliage and habit. Their leaves are bright, smooth, shining green. Left to themselves, they send shoots out along the ground and increase rapidly. There is a variety with leaves edged white, which is not common, and is a pretty foliage plant called *V. Major elegantisima.*

VIRGILIA.

Nat. ord., Leguminosæ.

V. Capensis.—Flowers rosy purple, ½ an inch long, and very fragrant, in racemes about 1½ inches long. A small

tree, with leaves about an inch long. The young leaves are silky and old ones smooth. More suited to the hills than the plains. Propagated by seed or by cuttings put down in sand. *V. Aurea* or *lutea*, a synonym of *Cladrastis tinctoria:* a small shrub with white or yellow flowers, in drooping racemes, like *Laburnum*, which it bears in the cold season. Propagated by seed.

VISCAREA.

Nat. ord., Caryophyllaceæ.

V. Rosacœlia (German Catchfly). – Flowers small, in close heads. There are several very desirable varieties of these plants; among them the double flowered form; and deep-red, which is known as *Splendens*, are particularly so.

They are effective when planted in masses. Sow the seed in the plains in October and in the hills in March.

VRIESIA.

Nat. ord., Bromeliacea.

These are somewhat like *Tillandsia*, so much so that they have been included under that head by some writers. See *Bellula fenestrates* and *Splendens* under the head of *Tillandsia.*

WAHLENBERGIA.

Nat. ord., Campanulaceæ.

W. Grandiflora and *W. Grandiflora alba.*—Small tuberous plants 1½ to 2 feet high, with straight stems (not branching), bearing at first buds of an inflated five-sided globe shape, and expanding into a cup-shaped flower with three to five-lobed corolla, somewhat pointed: in the first mentioned variety purplish-blue and outside greenish-blue; in the second very light bluish or very light purplish-white. In autumn the plants die down, but come up again in spring.

Plants with leaves somewhat in whorls round the stem. They do very well in the North-West Provinces and hills, and I dare say would succeed in Bengal. *W. Hederacea*,

W. Kitabellii, *W. Saxicolla*, *W. Tennifolia* and *W. Tuberosa* are other good species.

WAITZIA.—*(Everlastings.)*

Nat. ord., Compositæ.

W. Aurea, flower heads rather large, golden yellow, and *W. Nivea*, rather large, snowy-white or pink.

Both everlasting flowers, somewhat like *Rhodanthe*. Sow the seed in the plains in October and in the hills in October and March, and plant out in clumps.

WALLICHEA.

Nat. ord., Palmæ.

W. Caryotoides.—Flowers yellowish-white. Fruit about the size of a nutmeg. Leaves alternate petiolate, leaflets sessile, 1 foot to 1¼ feet long, wedge-shaped, shining green above, whitish beneath. Height 3 to 8 feet. *W. Densiflora*, an Assam species, 12 feet high, not so handsome as *W. Caryotoides*.

WATSONIA.

Nat. ord., Irideæ.

These are very pretty when in flower, are South African plants which should do very well in the North-West Provinces and the hills, and perhaps in Bengal, but I do not know if they have been introduced. They require a very light soil, with leaf-mould as a compost, and are best grown in a hot bed or pit in preference to pot culture, and if grown in open beds require protection from frost. *W. Densiflora*, flowers in a dense spike, rose-red; tube 1½ inches long, spreading; segments ½ to ¾ inch long, on a scape 1½ to 2 feet long. Leaves linear, the length of the scape.

WEIGELIA OR WEIGELA.

Nat. ord., Caprifoliaceæ.

W. Rosea, properly *Diervilla rosea monstrosa (vide* "Genera Plantarum"), is a shrub described by Firminger

under the first name mentioned as being quite unsuited to Bengal. I dare say they would do in the North-West Provinces, and certainly in the hill-stations of India. The flowers are rosy-white, borne all along the stems very numerously. There are several varieties of it, *Nana aurea*, *Nana Stelzueri* being a very floriferous purplish-red form.

WENDLANDIA.

Nat. ord., Rubiaceæ.

W. Paniculata and *W. Tinctoria* bear flowers much the same, white, but *Tinctoria* bears larger panicles. The leaves of the first named are lanceolate, 5 to 8 inches long, that of the latter ovate, 4 to 8 inches long. Very handsome plants when in flower. Height 6 feet.

WHITLAVIA.

Nat. ord., Hydrophyllaceæ.

The plant known to us as *Whitlavia* is properly *Phacelia*, according to the authors of "Genera Plantarum," and is a handsome annual bearing bell-shaped flowers. They thrive well in all parts of India, and there are several varieties. Sow the seed in October in the plains, and in October and March in hill-stations. *Parcelia grandiflora*, violet-purple. *Gloxinioides*, blotched blue and white. *Viscida*, blue. The flowers are borne in racemes opposite the leaves, and are bell-shaped in the latter species.

WIGANDIA.

Nat. ord., Hydrophyllaceæ.

These are handsome foliage plants remarkable for their large leaves. Good as single specimens on lawns. Raised from seed sown in October in the plains and October and March in the hills: also by cuttings in a sandy soil.

W. Macrophylla, *W. Vigieri*, *W. Caracenana*, syn. *Macrophylla*.

WISTARIA.

Nat. ord., Leguminosæ.

W. Chinensis.—A truly lovely plant of rather climbing habit, though when cut back may be made to form a bush. Not suitable to Bengal, but flourishes in the hills, where it flowers in a leafless state in great profusion in spring, with huge bunches of lovely delicate lavender or purple flowers quite covering the plants. *W. C. Flore-pleno*, a handsome double flowered variety. *W. C. Macrobotrytis*, white, tinted bluish-purple. *W. C. Variegata*, with silvery foliage. *W. Sinensis* is a synonym of *W. Chinensis*, also *Glycine Chinensis*. *W. Japonica*, flower white, in racemes. Leaves quite different to *W. Chinensis*, being botanically described "impartipinnate four to six-jugate."

WRIGHTIA.—*(Syn. Balfouria.) (Palay or Ivory Tree.)*

Nat. ord., Apocynaceæ.

W. Antidysenterica.—Flowers white, sweet scented, borne in the hot season. Leaves ovate. A small tree. *W. Coccinea* bears in the hot months scarlet, velvety flowers in cymes of three to four flowers. Leaves elliptic-lanceolate, 3 to 5 inches long, smooth, slightly undulate. A handsome small tree. In the cold season long cylindrical seed vessels may be seen hanging from the tree. Propagated by seed sown as soon as it is ripe, or by cuttings during the rains.

XYLOPHYLLA.

Nat. ord., Euphorbiaceæ.

X. Augustafolia.—A peculiar-looking plant with erect, small, strap-shaped-looking leaves, which are edged with minute yellowish-green flowers nearly at all seasons, but more so in October and November. *X. Elongata* is a larger plant, but in other respects the same.

YUCCA.—*(Adam's Needle. Bear's Grass. Spanish Bayonet.)*

Nat. ord., Liliaceæ.

Yuccas Alifolia, Gloriosa and *Stricta* are much the same in general appearance, but *Gloriosa* is a very much larger plant than *Alifolia;* and *Stricta* much smaller and seemingly unsuited to the climate. *Y. Alifolia* bears a large spike with many branches of fine egg-formed pure white flowers in immense numbers in the rains, and is very handsome at any time, but more so when in flower. The flowering is induced by the removal of the lower leaves. It grows in almost any soil, and is propagated by offsets. There are several species of this plant that have not been introduced to India: *Y. Filamentosa, Y. Flaccida, Y. Filimentosa orchioides,* which latter has few leaves and large flowers in an unbranched spike.

Y. Filifera, with much the appearance of a palm-like stem, with Yucca-like leaves and a huge drooping inflorescence 6 to 8 feet long. A native of Mexico. A tree.

Y. Gloriosa is a branching species with tufts of leaves on each branch surmounted by its flowers. A very large shrub.

Y. Gloriosa recurvifolia is a plant something like *Alifolia,* but with recurving leaves. These are all handsome species, which I hope may be imported, as they are worthy of it.

ZAMIA.

Nat. ord., Cycadaceæ.

These plants resemble palms, and in some particulars ferns. They are all natives of tropical America. There are several species that have been introduced, the chief of which are *Z. Integrifolia, Frufuracea* and *Lindenii.* Other good species are *Z. Picta, Z. Wallisii, Z. Pumila, Z. Amplifolia.* They are not easily propagated, and are generally imported. They succeed in our grass conservatories in India.

ZEPHYRANTHES.

Nat. ord., Amryllideæ.

A large number of these species are grown in this country, and deservedly so, as they are really pretty little bulbous plants, that grow with little care, in almost any soil, with little cultivation, of which they are more worthy than is bestowed on them.

They bear Crocus-like flowers, singly, on a longish stem.

Z. Atamasco (Peruvian Swamp Lily), white. *Z. Andersoni*, copper color. *Z. Candida*, white. *Z. Crinata*, reddish. *Z. Citrina*, yellow. *Z. Macrosiphon*, rose. *Z. Mesochloa*, greenish-white. *Z. Rosea*, rose. *Z. Sulphurea*, yellow. *Z. Versicolor*, rose and white, variable. They are best planted in a compost of loam, leaf-mould and old cow-dung, either in beds or in pots. Their leaves are long and narrow-linear or semi-cylindric. Not unfrequently their flowers appear in profusion after a good shower of rain. It is best to leave their bulbs undisturbed for a year or two, when they will require transplanting, after being divided. In the hills, it is best to protect them with leaves or old manure in winter. Some of these may be procured from seedsmen, and all can be obtained from the Agricultural and Horticultural Society's Gardens, Calcutta, and Botanical Gardens in India.

ZINNIA.

Nat. ord., Compositæ.

Z. Elegans.— This is one of the finest, most showy and useful annuals we have. The variety of coloring displayed by it is unbounded, barring blue, added to which there are many variegated sorts, which are very beautiful. The double varieties should only be grown, and those that turn out single should be weeded out. Very often, however, the first flower borne is single, and after that double ones appear on the same plant. The single flowers it first bears should in this instance be plucked off, and after that, if double flowers do not appear,

the plant should be weeded out. Sow the seeds in the plains early in June, in boxes; and in the hills, perhaps it is best to sow them somewhat earlier (in May). The plants should be transplanted and watered till the rains set in in the hills and then planted out. Zinnias sow themselves, but it is best to rely on carefully selected seed. The double flowers are sometimes very large, almost the size of a Dahlia, and remain in full beauty a long time. The plants should be planted out as soon as they are strong enough to stand a little exposure ; if allowed to stand where sown, the plants are liable to bear single flowers. Seed of Zinnias in separate colors may be got from the Himalayan Seed Stores, Mussoorie, N.-W. P. *Zinnia Tom Thumb* is a dwarf variety (in all the colors). *Pumila fl. pl.* is an intermediately dwarf variety. *Haageana fl. pl.* is taller and of all colors. *Zinnia new Mammoth* is very large, very double, and of all colors. Very free flowering : 3 feet high. Seed should be gathered of these flowers, as the blooms do not degenerate from acclimatised seed

New varieties are sometimes procured. But be careful in selecting the best flowers.

CHAPTER X.

CULTIVATION OF IMPORTED VEGETABLE SEEDS.

I DO not think there can be any better form of garden than a square or a parallelogram. The walks should be at least five or six feet wide, and a small bed, four feet wide, should run parallel with the walks for herbs and flowers, which will much relieve the heavy appearance of the kitchen garden, which in India is rarely an object of ornament, though with a little care and taste it might be made so. I consider a South-East slope the best for a garden intended for the cultivation of imported vegetable seeds, as the sun is more to the South in winter; and when the warm weather sets in, it is more protected from the dry West-winds so injurious to the proper growth of vegetables in the plains of the North-West and Upper Bengal. A well made in the North-West corner of the garden (should it be sloping to the South-East) will water the whole garden without having recourse to embankments to run the water along, which will be requisite should the garden be level: a slope to the East, or a level piece of ground, would be the next best, if the soil be well-drained, and not of a damp nature. A fairly light soil or good sandy loam is the best, but it is necessary to mix it with a quantity of well-rotted cow-dung or stable litter, or leaf-mould, ploughing it well in.

If you are near an Indigo factory, and can procure the broken refuse indigo stalks, called by natives *Seethee Goondee*, there is nothing I can recommend more highly as manure, being charged largely with ammonia, which is so requisite for the growth of plants; it is decidedly better than any leaf-mould that can be prepared, and, when procurable, it should be used in its stead.

I speak of this with the greatest confidence, having tried it year after year with most satisfactory results to all vegetables.

The next thing requisite is to procure the best seed to be got. No good result can be expected from bad seed. The seeds should always be fresh, and when received, from whatever source they be obtained, should be kept as free from exposure to damp air as practicable.

Packages and cases should not be opened from idle curiosity merely to examine the contents A fair day should be chosen to open the case for use only. After the seed required is taken out, the remainder may be put into bottles No. 1, No. 2, and so on, with new corks for them. The bottles should be perfectly dry. No. 1 bottle should contain the seeds first required; No. 2 the seed next required, and so on.

Should this simple advice be followed, any seeds may be kept good. A little bee's-wax put round the corks will keep the bottles even more air-tight and secure.

I am convinced that more failures take place from the careless management of seed than can be conceived, for why should some fail with the same seed which others have succeeded with? Frequently seed is blamed when it does not germinate, or germinates irregularly: yet it is often more the fault of the gardener than of the seed. Sometimes, and not unfrequently, they are stolen, or sown in either too moist or too dry a soil. I would therefore recommend every person, having a garden, to see them sown before him, or, if this is not practicable, to depute some trustworthy servant to see the seeds are sown, and to see himself to the proper humidity of the soil before sowing is begun.

The cultivator should also bear in mind that to sow seed in soil just tilled is not the way to receive a return for labour. The garden must be well ploughed or dug up some days before sowing or transplanting, and be continually

ploughed to that time. Soil must be exposed to air to benefit the plant it is to nourish; and it is of the greatest importance that the above directions be carried out fully and strictly.

Begin ploughing or digging in May, and continue doing so, on fine days, when the soil is not too wet, till you plant or sow your beds, and the expense of so doing will never be regretted, provided, 1st, that you have procured good seed; 2nd, that you have kept it well; 3rd, that you have weeded and manured your crops, and last, but not least, that you have watered judiciously. The ground should not be so moist as to ball when rubbed up with the hands.

If seeds are sown early and in the open, the beds should be raised two inches in case of rain; and fair weather should be chosen.

If the sowings are made later, the beds should be sunk two or three inches, always choosing fair weather. As a general rule, spread two inches of manure over the bed, and dig it in with a hoe: rub the soil with the hands so as to pulverise it thoroughly. The manure used should be one-quarter old cow-dung and three-quarters of leaf-mould, or *seethee goondee* (which is better if obtainable). The seed bed is then ready to receive what you purpose sowing. The beds should never be allowed to be too dry or too wet, and, if necessary, should be re-watered before germination takes place. After each watering, and when the soil is dry enough, care should be taken that the soil does not form a crust on the surface: if it does, prick the surface of the soil all over closely with a sharp pointed piece of stick, or iron, so as to allow the seedlings to come through; otherwise they may not appear at all, or only come through very imperfectly. I would also recommend, before sowing, that about a quarter of an inch of sand be worked into the surface of the ground to prevent crusting or caking of the surface soil.

Before seedlings have thoroughly established themselves, water sparingly, as they are then unable to digest what they

absorb. As the organs of the seedlings perfect themselves, they will require more water according to their size, and in case of heavy rain, the seed-beds should be provided with mats to cover them projecting a little beyond the seed-beds on all sides. This roofing should be so constructed as to fold on its centre, either one way or the other, when the sun has got over on one side, or should it be raining, each could be put into its proper place for the protection of the seedlings from rain, which would certainly damage if not entirely destroy them.

I would also recommend that seed beds should never be made too broad; certainly not more than four feet in width, though they may be made as long as you choose, as it is difficult for a gardener to reach over to the centre of a broad bed in watering, weeding, or breaking the crust of the surface soil.

In finally planting out, all vegetables should be planted out in a neat, systematic way, according to directions given for each kind of vegetable.

Thus there is some neatness and workman-like style even in this department.

I think every vegetable garden should be made attractive by at least being neat in appearance.

It may be made quite ornamental by having nice roads round each plot, bordered by a few small-growing shrubs and annuals.

CHAPTER XI.

DESCRIPTIVE LIST OF VEGETABLE SEEDS.

ARTICHOKE.—(Cynara Scolymus.)

Nat. ord., Compositæ.

Native name, HATHECHOKE.

THE seed of the Artichoke is best imported from Italy, France, England or America; though I give the preference to Italy or France, as the Artichoke is most cultivated in those countries, and is brought to great perfection there. Country seed is easily obtained, but can never be relied on, as it frequently yields worthless flowers; chiefly from want of care in the cultivation of the plant. The seed should be sown as early as August in pots, and in September in beds; this applies to Bengal: Up-country, in the North-West Provinces and the Punjab, sowings may be begun in July in pots and boxes. Care should be taken to expose these to the sun whenever heavy showers are over: that is, after the seed has germinated.

In the hills the Artichoke may be sown in March and April in beds, and again in August and September in pots or boxes, and sheltered.

For later sowings prepare the soil for receiving the seed by first digging deeply, and mixing the soil with a compost of old cow-dung and leaf-mould in equal proportions. The quantity of manure for this vegetable can hardly be too great; yet everyone should be guided considerably by the quality of the soil. After this, the seed may be sown. Then trenches should be dug about two feet deep, and four feet from row to row, and the soil in them dug deeply, incorporating about six inches, in depth, manure composed of equal parts of leaf-mould, cow-dung and salt (or stable manure,

with a sprinkling of salt added). When the seedlings are about five inches high, they should be removed from the seed beds to the trenches, taking great care that the tap root, which is unusually long in these plants, be not injured or broken. For two or three days after transplanting they should be shaded from the sun during the warmer part of the day, as the plants are then very delicate. The plants should be set out one by one in the trenches, about two-and-a-half feet apart. Artichokes require a great deal of water, and therefore the soil should always be kept moist.

A second manuring, with about half the amount of manure first used in the trenches, may be successfully employed about a month-and-a-half after the young plants have been finally placed in their situation. Liquid manure may be used beneficially. The trenches should be dug frequently, and kept free of weeds.

Nothing is more prejudicial to the cultivation than the appearance of green mould on the surface of the soil

The Artichoke is a biennial, or even perennial I may say, as I have grown it for several years, and I have propagated it by offsets when I wished to keep a particularly good variety.

Not unfrequently it bears better the second or third year than it does the first season. Should you purpose keeping the old roots, the plants should be allowed to die down after bearing, by discontinuing watering. No further care is then necessary than to keep the trenches free of weeds: and in September of the following year, after planting, the soil should again be enriched with the same quantity of manure, well and deeply dug, pulverising the soil with the hands. The roots will by this time have thrown out shoots previous to the digging and manuring. Should the trenches be dug before that, the gardener will be liable to cut the roots and kill them.

This plant is also cultivated by offsets called chards, and sometimes these are used as cardoons, planted and then blanched after the fashion of celery, when they are boiled

and eaten as a vegetable. Strip them off the parent stem, cut the end sloping, and plant them just as the seedlings were planted in the trenches with a dibber; then shade with mats, till they take root and send out leaves. The Artichoke is a native of the South of Europe and North of Africa, and flourishes in a temperate climate, and with proper treatment, it will give perfect satisfaction, being planted early as a winter vegetable in this country, when the climate suits its requirements. The trenches should be made of the following form:—

T. being the trenches. In the rains the water which would collect in these trenches should have an outlet if you wish to keep the old plants, or a great many of them will rot off. When the plants are bearing, or are just going to bear, all offsets should be cut off and not allowed to grow. There are many fine varieties of Artichoke, either green globe or a purple globe, but a distinct improvement on these is *Artichoke Remontant*, which bears large spineless heads. *Artichoke Modica*, also spineless heads which are very large. *Artichoke Terranova*, the leaves on the heads being very long, narrow, but fleshy. These are all novelties worthy of special notice. Seed is procurable from the Himalayan Seed Stores, Mussoorie, North-West Provinces, of these fine new introductions.

In the hills Artichokes go on living, thriving and bearing for many years in succession. In the plains, the rains kill many of the plants chiefly owing to defective drainage), but if those that remain are manured, they yield an early crop of heads, before the seedling plants come into bearing.

ARROW-ROOT.—*(Maranta Arundinaceæ.)*

Nat. ord., Marantaceæ.

This root makes the best arrow-root properly speaking, as other roots are used to make an imitation of it.

Make trenches a foot-and-a-half to two feet deep, and the same distance apart, and return the soil well mixed with manure and leaf-mould : in this plant the tubers, from a foot to a foot-and-a-quarter apart. Earth up the plants when eight inches to a foot high, and occasionally loosen up the soil round about the plants in the rows and keep earthed up and free from weeds. These tubers should be planted in May, just before the rains start, in the plains. The small roots and tips of the large roots are used for planting. The crop is generally ready to be taken up in February, and sometimes as late as March. It grows well in Bengal, the North-West and Punjab, and probably all over the plains of India. I have not seen it grown on the hills. The mode of preparing it is by first washing the roots, then either by pounding them, or grating the root on a tin perforated with holes made with a nail into a tub of water. If pounded, the mash is put into a tub of water (but grating the root is preferable). When the powder is freed from the fibrous substance by mixing with the water, it is strained through a coarse cloth and allowed to settle. The water is then gradually poured off without disturbing the sediment laying at the bottom. This is repeated several times, and each time when fresh water is added the powder is well stirred up and allowed to settle, and again the water is poured off. This should be done with good clear water and should be repeated three or four times. When sufficiently washed, the powder is taken out of the tubs and dried on clean cloth sheets in the sun till perfectly dry, when it should be stored away in tins and soldered, or put into stoppered or corked bottles.

ASPARAGUS.—*(Asparagus Officinalis.)*

Nat. ord., Liliaceæ.

Native name, MURCHOBA or PALAGRAS.

This delicious esculent, which comes into season in this country when other European vegetables go out, is sown in

Bengal during the months of August and September. In the North-West Provinces it should be sown as early as August. In the hills it may be sown in April and May, and again from the close of the rains right on to October. In the rains even it may be sown in pots and boxes and transplanted when the rains are over.

Sow the seed in beds or boxes. The soil in which it is sown should be rich in mould, and the plants most generously treated afterwards with old stable manure and cow-dung.

The seedlings should be transplanted ten inches apart when they are strong enough to be handled, say when six inches high, putting them into trenches about a foot-and-a-half deep, filled with a quantity of sand, leaf-mould, stable manure or cow-dung, with a layer of broken bricks under the manure to ensure good drainage. For the first year the plants may be allowed to grow to stalk, and the second year they may be slightly cropped; this should be cautiously done, as by cutting too much away from the plants they are likely to flag in growth, and yield imperfect stalks. I would recommend the earth or old manure being removed from their roots once or twice a year, say once during the beginning of June, and once in January, and the same amount that has been removed should be replaced by fresh manure of the same compost as before mentioned. The soil should always be kept well loosened up in the trenches, so as to enable the plants to send their shoots through easily.

Watering copiously during the month, just before they will yield a crop in March, is necessary. During the rains no further care is required than digging and keeping the trenches free of weed, and another crop may be expected in June and July.

Some consider it unnecessary to remove the berries that appear during the months of May and June. I think this essential in order to promote the growth of new stalks.

Salt used as a manure to these plants has been found to be very beneficial, and I recommend it: a little sprinkled on the surface of the trenches, just before watering, will yield good results.

Regular drenching with water is necessary and conducive to success, especially, as I have before stated, previous to cropping and in hot dry weather.

The Asparagus is a hardy plant, and may survive the most careless treatment, yet it is very necessary to follow out these instructions if you would meet with a good return for the labour expended on it. It is largely grown in France, more so perhaps than in any other country, and there are many varieties of it, which all come under the two heads of purple-topped and green-topped Asparagus. *The Colossal* is a good variety, as also is *The Large Purple* and *The Giant.*

Beds of Asparagus, if treated generously with manure and water, and not cut too severely, will last for years. Mr. James N. T. Wood, in his "Manual on Gardening," says:—"From the second or third year, the bed will commence, and supply a good crop for ten more years." I have no doubt of this, as I have had a bed of Asparagus for six years in perfect bearing, and had I the opportunity of cultivating it, I dare say it might have lasted as long again, and during that time have remained good and unimpaired: but manuring requires attention and care, and they must be generously treated.

Lieut.-Col. T. M. Shelly says:—"A V shaped trench is the best;" from this I would differ, as it does not allow the plant sufficient width at the bottom of the trench to be properly manured. I would therefore recommend the same sort of trench as described for Artichokes, but let them be a foot deep.

BASIL.—*(Ocymum Basilicum.)*

Nat. ord., Labiatæ.

Native name, GOOLAL TOOLSEE.

This plant is quite a weed in this country, and requires no special care; if once sown it will re-sow itself. If imported

seed be procured, sow the same in October and November, and transplant when the seedlings are strong enough, taking up a good ball of earth with them, planting them a foot apart in a soil of leaf-mould and any ordinary garden soil. The plants should be well watered in the dry season.

BEANS.—*(Phaseolus.)*

Nat. ord., Leguminosæ.

Native name, SEEM.

Under the head of beans there is a large variety *(Faba vulgaris, Phaseolus vulgaris, Phaseolus multiflorus, Phaseolus lunatus*, and many others). The seeds of all European varieties should be sown in September, October and November, after the rains are over, both in Bengal and the North-West Provinces. But the native beans, called "BURBUTTEE" *(Dolichos Sinensis)* and "MUKHUN SEEM" *(Canavalia gladiata)*, should be sown in June, and these bear before the English varieties of beans. The "BURBUTTEE" Bean has not much to recommend it, but the "MUKHUN SEEM" is certainly a good and useful vegetable, but it is a rampant climber and requires lots of room. The "KHAMACH" *(Mucuna Nivea)* or Velvet Bean is an excellent native bean of superior flavour. When the surface of the bean is scraped off and it is boiled, there is little doubt it is one of the best beans we have. Its seeds should be sown in June and July. Steep the large seeds for about three hours in hot water, which the hand can just bear, and the smaller varieties for two hours. Then allow them to dry for four or five hours, and plant the large varieties ten inches apart from seed to seed, and the smaller varieties at about four inches apart, and three inches deep, in single rows. The tall growing varieties will require stakes, such as the Scarlet Runner *(Phaseolus multiflorus)* and the Lima Bean *(Phaseolus lunatus)*. In the hills, beans may be sown in May, June, July and August. Sown in March and April they require careful watering during the dry months.

The soil for beans should never be too rich, and they should not be sown in two rows close together, as is sometimes the custom, nor should they be watered much, and only when the soil seems to be getting too dry. The soil should never be humid to the very surface, except just after watering. When they have borne their flowers, and these are fading, the tops of the plants should be pinched off, which will induce the pods to fill. Slightly shaded situations are the best for all sorts of *Phaseolus*.

Never allow the soil to be crusted: after watering, it should be well worked with the *khoorpee* or hoe, and then pulverised with the hand. The Scarlet Runner Bean has been repeatedly tried in the plains without bearing pods, or if it has done so, very unsatisfactorily. I would therefore recommend that its tops be pinched off freely, and that it should not be allowed to grow as a runner, but in the shape of a bush: I have tried this with some success, yet the yield was nothing like what it should have been. In the hills the Scarlet Runner Beans do very well indeed.

Phaseolus nanus or the dwarf FRENCH BEANS do best in a moderately shaded position on the plains, and they require a moderately good soil, well drained. *Canadian Wonder*, *Monster*, *Long-podded Negro*, *Ne Plus Ultra*, *Sir Joseph Paxton*, and *The Shah* belong to this class.

DWARF or KIDNEY BEANS, wax pod varieties, require the same treatment as French Beans. They should have moderately rich soil and should be sown in single rows. They are fast superseding French Beans in popularity. Good varieties are *Crystal White Wax*, *Dwarf Golden Butter Wax*, *Early Dwarf German Wax*, *Flageolet Wax*.

Faba Vulgaris, the BROAD BEAN, known by native *malies* as "*Bakla Seem*," is generally sown at the beginning of the cold weather in the plains in September and October, but is neither very productive nor does it possess the flavour it does in England or on the Continent. It is best to steep the seeds as directed for beans generally. The flowers set

best when the tips of the plants are nipped off when they are in flower, or they go on flowering without setting. It gives little satisfaction on the plains, and even on the hills, and the French, Kidney Beans and Runner Beans give far better results

Phaseolus Multiflorus or RUNNER BEANS are all more or less tall climbing plants and require supports. The Scarlet Runner Beans do splendidly on the hills; I do not recommend them for the plains: but the other varieties of this class, such as *Flageolet Wax*, *Bulgarian Butter Giant Wax*, *Ne plus Ultra*, *Veitche's climbing French* and many others, all do well both on the plains and hills. The latter is a fine novelty introduced by the Himalayan Seed Stores, Mussoorie, as also *Giantess*, which, however, is a scarlet runner, and like *Hill's Prize*, scarlet runner, and *Titian Runner*, also a scarlet variety, are all fine varieties highly to be recommended.

Lablab Vulgare are native beans, which are climbers, and do well in the plains, but not in the hills, except at low elevations. The beans are broad and short, and are useful when required for vegetable curries. Sometimes they are boiled and served up as English and Continental Beans, but are insipid in comparison. There are several varieties of it, as also of *Lablab Culturatum*, which is much like a Kidney Bean so far as the bean is concerned, but the plants are climbers and are far inferior in flavour. The seeds of *Lablab Vulgare* and *Culturatum* are sown in the rains, and at the close of the rains.

Psophocarpus Tetragonolobus, an Indian Bean, known by *malies* as "CHAR-KONIA SEEM," bears a peculiar four-sided pod, frilled as it were at the edges. The seed of this species are sown in the rains, and cooked as other beans, simply in water or in vegetable curries, is not to be despised when English vegetables are not to be got. Its flowers are of a blue color and ornamental.

Mucuna Nivea and *Pruriens*, variety *Utilis*, I have mentioned before as a really excellent native bean, known by

natives as the "MUKMUL SEEM" and by Europeans as the VELVET BEAN. It is a tall climber and prolific bearer, requires support, and the seeds are sown in June or July. In the paper "Indian Gardening" this bean has lately been noticed as having drawn the attention of the "Garden Chronicle" in England as the *Florida Velvet Bean*, an excellent food and fodder crop. I have frequently grown it in the plains, and I question if there is any great difference in the varieties.

Phaseolus lunatus, the LIMA BEAN, when cooked is shelled or taken out of its pod, which is not eaten. The beans require to be cooked for several hours before being ready for table use, as they are very hard. There are several varieties, all strong and tall growers, which require the support of posts or tall sticks. The seeds are sown in September and October in the plains. These are excellent beans and come into season when others have gone out. In the hills the seed should be sown from March to June.

BEET.—*(Beta Vulgaris.)*

Nat. ord., Chenopodiaceæ.

Native name, CHUCKUNDA.

It is largely cultivated in this country for table use, more so than in England. Large quantities are grown on the Continent for the purpose of making sugar.

The seed should be sown in pots or boxes in August and September in Bengal, and in July and August in the North-West Provinces, and if they are to be sown in the open, they should be sown a month later in both places. In the hills sow in boxes in February and in open beds in March and April, and again in September or October. Should they be sown in pots for an early crop, the soil should be light and rich in leaf-mould. A little salt added to the manure will assist the growth. The best way to sow it in beds is to make small holes, not too deep, about eight to ten inches apart, into which

put two or three seeds and then thin out, so as to leave one plant only in each place. The beds should be prepared thus :— Dig out about two feet of earth, mix it with manure, which should be leaf-mould and cow-dung, or stable manure (which latter, however, is not so desirable), and replace the earth, after which the seeds should be planted as above mentioned.

Sparrows are very destructive to it in some localities, and in such cases a net should be put over the beds. The plots for Beet should be richly manured, and dug deeply to about three feet and carefully pulverised, so that not a single clod be left larger than a pea, otherwise the roots are sure to be deformed and forked. Red Beet is the most desirable for the table, though there is also a white description.

If the seed has been sown in *gumlahs* or boxes, the plants should be transplanted. Such beds as I have before mentioned should be prepared for those which have to be sown in beds. They should be watered freely and frequently, as they enjoy a humid soil, which should at intervals be well dug and always kept free of weeds. When weeding Beet beds, care should be taken not to break the leaves, as this is injurious to them, and withal they are extremely brittle and liable to be damaged. The beds should be so arranged as to be fully exposed to the sun's rays. Liquid manure is useful with this vegetable. It is advisable to sow some seed early in pots and boxes, as the plants are liable to damp off when sown too early, before the rains are well over, the main crop being sown later on both in the hills and plains. In the hills very early sowings may be made in February in pots or in a frame, thus securing a very early crop. A second and third sowing may be made a month after the first, for succession ; yet I hardly think this necessary, for if you have sown a sufficient quantity during the main sowing for your purposes, the vegetable does not grow fibrous so soon as other roots do.

Frequently Beet has been found fault with for not having the color it has been called by, blood-red. This is generally

the fault of the cook, who injures the surface of the root before or while cooking it; care should be taken not to strip off the leaves or cut off the tap root before boiling. If the leaves have to be taken off, they should be cut fully an inch above the root, and all its skin left on till after boiling. The best novelties of late years have been *B. Cheltenham green leaved*, with fairly large roots, of a fine color. *B. Veitch's superb red*, a fine Beet of good color and good size, with very ornamental foliage. *B. Dracaena leaved* and *B. New Giant Seakale* have highly ornamental foliage, and are in advance in flavour on the older varieties. *B. Brydon's Exhibition* is one of the finest Beet in flavour or color, free from the light color between the rings which show when Beet of the other varieties are cut. These are novelties procurable from the Himalayan Seed Stores, Mussoorie, North-West Provinces.

BRINGAL, EGG-PLANT, AUBERGINE.—*(Solanum Melongena.)*

Nat. ord., Solanaceæ.

Native name, BEGOON.

A native vegetable which has received little attention till of late in Europe and America. Now the seed of it is imported to this country; but I doubt not we possess finer varieties of it in this country. I have seen the fruit grown to an immense size, and perfectly sound, of the large purple globular and large globular green varieties. These varieties are used at our tables: after boiling the inside is scooped out, then they are cut in half, and the contents are flavoured or not according to choice, returned into the two halves, covered with bread crumbs and butter, and baked. Other varieties are oval, green or purple in color, and are used for the same purpose; there are others long cylindrical, either purple, white or green, which are used for curry chiefly, or are cut in fine slices and fried. The seeds of bringals should be sown in the plains early in June to the close of July in seed beds, and when about six inches high are transplanted in the field

two feet apart. In a good rich soil they grow very large and handsome fruit.

In the hills it cannot be grown in the open, except at very low elevations, below 2,000 feet or so, where the temperature is almost the same as in the plains. It can be grown in conservatories, but that is not worthwhile, as it is brought up to the hill markets by natives.

BROCOLI.—*(Brassica oleracea Botrytis cauliflora.)*

Nat. ord., Brassicaceæ.

The treatment of this plant is much the same as that of the Cauliflower, to which I refer the reader, with this difference only, that it should be transplanted once oftener, that is to say, four times, and the plant should be allowed to be large and strong the last time of transplanting, before it is planted out in the field. The soil used should be of the richest description of leaf-mould. I have found this plant succeed thoroughly in this country under this treatment, and can therefore recommend the trial of it. Mr. J. N. T. Wood says, in his "Hand-book of Gardening": "Repeated attempts have been made in Bengal, as well as in the North-West Provinces, to cultivate this vegetable, without attaining that success which would repay time, trouble, and expense." In this I differ from him, as I have found it do just as well as Cauliflower in Upper Bengal, forming fine and compact heads year after year.

This may be from my having used refuse indigo stalk dust *(seethee goondee)* instead of the ordinary leaf-mould, to which I consider it infinitely superior, or it may possibly be from the locality in which they were sown. *(See* CAULIFLOWER).

BRUSSELS SPROUTS.—*(Brassica oleracea var.)*

Nat. ord., Cruciferæ.

Native name, GOONEGOON KOBEE.

This is another of the genus *Brassica*, and should be treated much in the same way as Cabbages, but should be sown in September and October in Bengal, and in September in the North-West Provinces. It might be sown in August, but I

do not see that any material advantage is gained by so doing, as the plants sown afterwards are ready nearly if not quite as soon. If the seed be sown before the rains are over, it should be sheltered. As soon as the second set of leaves has matured is about the best time to transplant into beds heavily manured with vegetable-mould and a little old cow-manure. The soil should be stiff, rich loam, into which the manure is mixed; and when the plants show signs of sprouting, and have reached their full height (which should be known by the top head beginning to cabbage), this head should be cut off, which will throw the whole strength of the plant into the sprouts. I have ascertained this from repeated trial. It is not frequently practised in this country, I am aware; yet in England some gardeners think this of vital importance, while others consider the practice detrimental. Mr. McIntosh says:—

"From their form and position they (the top heads) protect the sprouts during winter and in wet weather from frost, snow and rain." As we have none of these in excess in the plains while our Brussels Sprouts are growing, I should, with confidence, recommend the centre head of the plants being taken off when they have attained their full height. The plants should be removed into the field, when they are about six to eight inches high, as a final removal from the seed beds. Trenches should be made about four to six inches deep for their reception. Plant them two feet apart, the soil being stiff and well enriched with leaf-mould (especially) and a small quantity of old cow-dung. The plants should be earthed up as they grow, and be supplied with a liberal quantity of water. Irrigation is recommended, as being by far the best mode of watering; they should also be drenched now and then with liquid manure.

CABBAGE.—*(Brassica oleracea.)*

Nat. ord., Cruciferæ.

Native name, BUNDA KOBEE.

The seed of all sorts of Cabbage (of which there is a vast number of named varieties so like each other as hardly to be

distinguishable from one another) should be sown in Bengal in August, September and October, and in the North-West Provinces in August and September, on raised beds with a mat covering, such as has been described under the head of General Instructions on Gardening. The same page will show how the seed should be sown; the surface soil having some sand sprinkled over the surface, so as to allow the young plants to come through. After they have thrown out their second set of leaves, transplant them to a richer bed of leaf-mould and a small portion of old cow-dung mixed with it, incorporated into the soil for about the depth of ten inches. Having planted them in these beds, about a foot apart, let the plants remain there, till about a foot high; then remove them finally to trenches made in a field, just as they are made for Brussels Sprouts, namely, four to six inches deep. The soil should be stiff: yet Cabbages do very fairly in lighter soil. The trenches should be richly manured with leaf-mould and a small portion of cow-dung or stable litter. The young plants should be planted two-and-a-half feet apart. This will give a good average distance between the plants for all varieties. Frequent watering will be required, and swamping the trenches is the best plan, mixing cow-dung with the water occasionally; but manure should only be added when the plants are more advanced. The best older sorts of Cabbage are *Early York*, *Early dwarf Sugar loaf*, *Late Sugar loaf*, *Vanack* (a very large cabbage), *Enfield market*, *Sutton's dwarf*, *Sutton's imperial*. Newer good varieties, which are obtainable from the Himalayan Seed Stores, Mussoorie, North-West Provinces, are *Cabbage flat Parisian*, *Christmas Drumhead*, *Warner's Drumhead*, *Early king*, and many others; in fact the names given to Cabbages are so numerous, it is puzzling to know which to choose. The *Sugar Loaf* varieties are so called from their conical head. The *Savoy Cabbage* is an excellent type, with crumpled leaves, which heads well and is very compact and dense. It stands the heat of the plains well. The *Drumhead*, at one

time considered coarse, is as fine as any and particularly sweet. The *Red Cabbage*, which everyone knows is only used for pickling, is the source of all the new varieties now known and so much improved. In the hills Cabbage seed may be sown from February to May and from July in pots and boxes, and in sheltered beds from late in August to October. These latter sowings will require to be protected in winter when in beds or when planted out.

CAPSICUM.—*(Capsicum.)*

Nat. ord., Solanaceæ.

Native name, MIRCHA, MIRICH, or LUNCHA.

All plants of this species are remarkable for the presence of an extremely acid resin called *Capsicine*. Some varieties have more of this substance in them than others; of these I do not purpose treating at present. The varieties I refer to are those large-fruited and very ornamental varieties, properly spoken of as Capsicums (the others being more properly called Chillies). Of the Ornamental Capsicum there are many very beautiful varieties, and I recommend to the notice of the cultivator the *Prince of Wales Capsicum*, *Golden Dawn*, *Ruby King*, *Elephant's Trunk*, *New Celestial*, *Procoppe Giant*, *Japanese Bouquet*, a small variety growing in upright clusters, green when young, afterwards yellow, then red, and the seed of a variety which I procured from Messrs. Lawson & Co., Edinburgh, called by them *Capsicum hybridum compactum*. Sow the seeds of imported Capsicum in September in the North-West Provinces, and in Bengal in October, in light soil enriched with leaf-mould; and shade only till the plants germinate; prick out the plants when they are strong enough to handle, and place them in pots of soil which is very sandy, and richly manured with leaf-mould. In the hills Capsicums should be sown in March and up to May, and again in October, when they require shelter during winter. Place them in the sun so that they have no shade at any time of the day, or the leaflets on the tops of the branches will curl up, and the

plants become barren. Should this occur, cut off all the tips of the branches, and they will send out healthy shoots. Water moderately; and take care that the pots are well drained. The fruit should be cut off, as in pulling them off the plants are frequently injured. Capsicums are very ornamental, and are used for pickling. The other smaller varieties are sown in July to October, or at almost any time of the year. I refer to what are known by natives as *Mirich* or *Mircha*, the various kinds used for culinary purposes in India, as also the Bird's-eye Chillies, which are exceedingly pungent and are used for making Cayenne-pepper and Chilly-vinegar. This small Bird's-eye Chilly is known to natives as the *Dhan-Mircha*. In the lower elevations of the Darjeeling hills it grows wild, and is brought to market at Kurseong and Tindharia by the hill-men. There is a Nepalese variety, short, of a yellow color, and very pungent, which makes excellent Cayenne-pepper. Botanically the above are known as *Capsicum baccatum*, Bird pepper; *C. Frutescens*, Goat pepper; *C. Grossum*, Capsicum proper or Bell pepper; *C. Annum*, Chilli; *C. Fastigiatum* or Cayenne Chilli.

CARROT.—*(Daucus Carota.)*

Nat. ord., Umbelliferæ.

Native name, LUMBA GAJUR, CHOTA GAJUR.

Of the Carrot there are three sorts—the long and the short, and blunt-rooted, of which again there are numerous varieties—the *Dutch Horn*, *Altringham*, *Long Surrey*, *Long Orange*, *Early Horn*, *French Horn*, *Carentan* or *Model James' Intermediate*, and many others. Like most vegetables that are at once sown out in the beds they are to occupy (and are not to be transplanted), they should be sown on raised beds, if sown before the rains are quite over; if after, in sunken beds. Carrots should be sown in Bengal in September to November, in the North-West Provinces in August to November. When the plants have germinated and got four leaves, they should be thinned out to four or five inches. The long

kinds should have more space than the short. The soil chosen for them should be light, and deeply dug: mix with sand if not light enough, and the seed being light, and easily blown away, a calm day should be chosen for the sowing of it.

It is very slow in germinating, and may, with benefit be placed in some damp sand to swell for about six or seven hours before sowing.

Too rich a soil causes the Carrot to fork; I would therefore only recommend a small quantity of leaf-mould and cow-dung to be mixed with the soil. The beds should be well-watered, in other words, flooded occasionally, and at no time should they be allowed to have any appearance of dryness. Should Carrots of a very large size be required, the following is a well-tried plan of obtaining them:—With a dibble make a deep hole, ramming the earth all round it, as hard as you can, then fill up the hole with fine light rich earth, and sow a few seeds on the top, and when they germinate, take all up but one, leaving the strongest-looking plant. I have over and again tried this experiment with success, and produced enormous Carrots from the *Long Surrey* and *Long Orange* varieties. If you should purpose gathering seed from Carrots, the crop you should select to get it from should be an early one. Cut off the root from nearly three-fourths of an inch from the top. Manure very richly with cow-dung, a spot very near some water drain in the garden, which is used nearly every day, and is constantly damp. Plant the top so as to leave only the leaves and centre above the soil, keeping the spot weeded, and no further care will be required till the seed is produced and is quite ripe.

When it is gathered, it should be perfectly dried in the sun and then stored away.

I have found seed produced from imported varieties do very well when sown the following season, but I do not recommend the practice. I only mention it to show that it retains its vitality for a long period.

Carrots may be kept for a long time in the ground if not subjected to the inroads of rats and mice, &c., as they do not get fibrous quickly. If they should be liable to be destroyed by vermin, take them up, cut off the leafy tops, and after exposing them to the sun for a few days, store them in some dry place for use as required. One of the best new kinds is the *Long red without core*. The *Long yellow stump-rooted* is another variety worthy of notice as excellent.

CAULIFLOWER.—*(Brassica Oleracea Botrytis.)*

Nat. ord., Cruciferæ.

Native name, PHOOL KOBEE.

Like most highly-prized vegetables, a number of varieties have been added by the care of the professional gardener, some however being identical with others, distinguished only by the difference of nomenclature.

I will therefore only mention a few of the sorts best known and most esteemed, among which are the *Walcheren*, *Early Asiatic*, *Late Asiatic* and *Carter's 'dwarf mammoth*, the last of which is an acquisition to the garden, bearing large heads on a thick and dwarf stem. Cauliflower novelties, *The Early Como*, *The Pearl*, and *The Monarch*, are good varieties introduced by the Himalayan Seed Stores, Mussoorie, North-West Provinces. A bed, four-and-a-half feet wide by ten feet long, will require about half an ounce of seed. This applies to Brocoli, Brussels Sprouts, Knole-Kole, and Cabbage, as well as to Cauliflower.

Prepare a bed with a good quantity of leaf-mould dug into the surface (it need not be dug very deeply, a foot will suffice). Pulverise well with the hands, mixing some sand and leaf-mould with it, then sow the seed. Care should be taken never to let the soil be too dry or too humid, a medium moisture being preferable. Water gradually more and more as the plants increase in size. Have another bed ready, more richly manured than the seed bed and thrice its size, for the

reception of the young seedlings, which should be removed into it when they are strong enough to handle, planting them at four to five inches apart; after they have established themselves in this bed, and grown, say, two or three inches more, remove them to a richer bed even than the last, which should be heavily manured with leaf-mould or *seethee goondee;* this bed should be a good deal larger than the second bed, and the plants should be planted further apart. If planted too closely, the plants will be drawn up and leggy. It must be remembered that to grow Cauliflower to perfection, the soil must be a light sandy loam, as rich as it is possible to be in leaf-mould. When the plant stems in the thickest parts have attained to about the thickness of half an inch in circumference, plant them out in rows, two-and-a-half feet apart and three feet from row to row. The rows of Cauliflowers should be in trenches a few inches deep, to allow the plants to be occasionally flooded with water. The soil in the trenches must be dug deeply, and can hardly be too rich, and the plants must be freely and frequently watered; during the intervals of watering, the soil should be loosened with the hoe or *khoorpee* (when not too wet). Digging the surface only with a native *khoorpee* is not sufficient, as it does not go deep enough.

If the plants are attacked by flies or other insects, the best remedy is to dust them over with cow-dung ashes (not wood ashes), which former can be obtained in abundance in the cold season at the door of almost every native hut. As soon as the plants have established themselves well in the trenches, use cow-dung in the water you flood the plants with, employing a man, all the time the water is flowing, in rubbing up cow-dung in the water with his hands. If these instructions are followed, I am positive of your having good results.

Some years ago, I tried the experiment of growing Cauliflowers (after the final removal) in soil which had turned to a dark brown color in consequence of water, flowing from indigo refuse, having lodged in it two or three months every

year. It is obvious the soil could hardly have been richer. The seedlings had, previous to being transplanted to this soil, been generously treated with refuse indigo stalk manure. The seed used was imported *Walcheren*. The first season the Cauliflowers were large and perfect; I allowed some of the heads to run to seed, and used the seed a second and third year in the same spot with increasingly good results. The size of the heads was enormous, and perfect in every respect. Unfortunately, in moving, this really excellent acclimatised seed was, much to my regret, irrecoverably destroyed.

When Cauliflowers have headed, break a few of the leaves and place them over the flowers; this will keep them white, and prevent their running into seed. If during the cold season the weather is foggy, it is much against the Cauliflower (or any of the Brassica tribe) coming to seed, should you desire to obtain it. If, therefore, the weather is inclined to be misty in the mornings and during the nights, and East winds are prevalent, to be certain of seed, you should take up some of the plants, when in head, and place them in pots, and before the sun has gone down, place them under shelter from the night dew and mist, putting them out again in the sun in their pots when the fog has cleared away in the morning. It is also necessary that no other Cauliflowers of any undesirable, or in fact of any variety, should be near them, as the pollen of one may be transferred to the other by insects, thus making it liable to deteriorate; as Cauliflowers are prone to hybridise.

Cauliflower seed may be sown in well-drained boxes or pots in July and August, and in beds with *jhaups* in September. This applies to Bengal and the North-West Provinces. In the hills sow the seed in February early under shelter, and in March to May in seed beds. Again it may be planted in shelter from rain from July or August to October, when sunny hours should be taken advantage of and the plant boxes removed to the sun. Plants that do not mature before winter

sets in in hill-stations, must be sheltered during winter with straw thrown over them.

On the subject of transplanting Cauliflowers a second or even a third time, some might be curious to ascertain the reason why it is done; I will therefore explain that it is done to prevent the growth of the stem, and promote balling. The head is improved by this retarding process. In this warm country, where vegetation is so rapid, it is even more necessary than in more temperate climates. This will be obvious to those who have studied the cultivation of this esculent.

CELERY.—*(Apium Graviolens.)*

Nat. ord., Umbelliferæ.

Native name, UJOODER, SHALAREE or SILDHERE.

Sow the seed in very moist light soil, in Bengal in August up to October, and in the North-West in August.

The earliest sowings will generally be found the best. Before the seed germinates keep the spot sown shaded; in fact, a slightly sheltered spot is always good for this plant. When large enough, transplant into trenches very highly manured with a large quantity of stable or cow-manure and a little leaf-mould, also some sand, mixing all these ingredients together, to a depth of a foot or more; then on the surface of this about four inches of soil should be placed; beat, or rather press this down gently. Take some of the strongest plants and place them singly about a foot apart in the trenches. When the plant is about a foot-and-a-half high, begin to earth up. Gather all the leaf stalks together in the left hand, earthing up with the right hand, pressing down the soil gently as you place it round the plant; this is to prevent the earth getting between the leaf stalks. Your Celery should be watered most generously every third or fourth day, and being a gross feeder and great exhauster of the soil, it will prove very beneficial to water with liquid manure every tenth day or oftener.

Another way of blanching Celery is by putting the roots and stem into earthen tubes about a foot long. Some do not approve of this; yet I have seen stalks not at all stringy produced by this plan; I would, however, recommend the former way of earthing up the plants to that of placing them in tubes. Whichever plan you adopt, you should begin blanching by earthing up or putting into tubes a fortnight before you purpose taking up the plants for use: otherwise the stalks will not be sufficiently blanched and tender. It must be remembered that Celery can hardly be watered or manured too much. There are two sorts of Celery—the white and the red—and of each there are numerous varieties. In watering care should be taken that the leaves are not wetted, and the roots only should be kept well supplied. Earthing up should not be done, all in one day: during a fortnight or so, go on earthing up a little every fourth day.

The red varieties of Celery are of stronger and firmer growth than the white.

Celery should be nearly full grown before earthing up is begun, and I consider that this plant has not attained its full size, however well attended to, till it has been about five months in the soil from the time of germinating. The seed not unfrequently takes a long time to germinate, so that fully a month should be allowed, or even six weeks, before you despair of it. The Rev. T. Firminger says, that it takes even two months to germinate when sown in August. I have not found it take so long a time, but I have no doubt that in some soils Celery will take longer to germinate than in others, such as red clay, or soils in which kunker or gooting lime is found, and other soils of a cold nature in which moisture cannot be retained for any length of time after watering.

All side shoots in Celery should be pulled off and only the main stem allowed to grow. Good seed should not produce side shoots; but through the whole growth of the plant care should be taken to prevent this. The best

varieties of Celery are *Manchester Giant, Sutton's solid dwarf white, Seymour's white champion, Cole's solid crystal white, Early dwarf solid white, Old solid red. Johnstone's champion white, Golden self-blanching*, and *Giant Arezzo* are novelties worthy of mention. Turnip-rooted Celery is not much grown in India, and is deserving of more attention. The part eaten of this (variety *Rapaceum)* is the root, which has a nutty flavour. It should be cultivated in the same way as ordinary Celery, but does not require earthing up or blanching. *Erfurt sweet, Giant Prague* and *New apple shaped* are good varieties.

CHEVRIL.—*(Anthriscus Cerefolium.)*

Nat. ord., Liliaceæ.

This is an aromatic sweet herb, useful for flavouring salads, soups, etc., but not so generally grown in India as it should be.

It should be grown in a moderately rich soil and sown for succession in September to February in the plains; and in February to May in the hills, and again in August and September. If protected, these later sowings will last out well into winter. *Chevril extra curled.*

CHIVES OR CIVES.—*(Allium Schœnoprasum.)*

Nat. ord., Liliaceæ.

This, too, like the last mentioned, is not much grown in India, and deserves to be better known, and it would be appreciated. This, however, is not a herb, though its leaves are used for culinary purposes as onions are employed.

The seed should be sown in the plains in October and November, and in the hills from March to May, in pots or boxes, and when the plants are growing quite thickly, should be divided off and planted a foot apart.

The leaves should be cut off close to the stem when required, leaving the roots undisturbed. They then go on yielding tender leaves.

COLOCASIA.—*(Antiquorum.)*

Nat. ord., Araceæ.

Native name, KUCHO.

This native vegetable is used when potatoes are not procurable. Its roots are irregular, cylindrical, oval or long in form, surrounded by brownish rings; its leaves large, Arum-like, deep green and smooth. Plant the roots in well manured trenches, or holes made a foot and a half to two feet in width, at the close of May or June. In these the tubers may be placed about a foot to a foot and a half apart. They require copious watering should the weather be dry. It is eaten first boiled, and then fried in slices, or in vegetable curry (first boiled, then curried).

CRESS.—*(Lepidium Sativum.)*

Nat. ord., Cruciferæ.

Native name, HALIM.

A plant easily grown in any rich soil Sow in Bengal in September, October or November, and in the North-West in August, September or October. Enrich the bed in which you purpose sowing it with leaf-mould chiefly, and scatter the seed thickly over the surface.

Water freely, and when the plants are five inches or more in height, cut off the tops to within three inches of the ground, using tops for garnishing salad, etc. It will remain longer in season if the seed stems are cut off as they appear, and if cut before they have grown to any considerable height, the leaves from the stalks will be of use.

WATER-CRESS *(Nasturtium officinale)* may be grown either by seed or by cuttings in any water-course or drain, and it thrives best if a little gravel or *soorkee* (pounded brick) is mixed with the soil where it is sown. It is anti-scorbutic, and is interesting in a chemical point of view as containing iodine. It may be grown in "nunds" or "nands," large

earthenware vessels, successfully. American Cress *(Barbarea Præcox)* is seldom grown in this country, as its leaves are used only as a substitute for water-cress, to which it is very inferior.

CUCUMBER.—*(Cucumis Sativus.)*

Nat. ord., Cucurbitaceæ.

Native name, KHERA.

Cucumbers from imported seed are difficult to rear in India as a rule; the chief cause of this is the plant being attacked by a small red beetle which devours its leaves and stems. The seed may be sown in the North-West Provinces, Punjab and Bengal from March till May, and again in October. In the hills the seed should be sown from April to June, and at lower elevations in October. English cucumbers do very well in the hills. A light rich soil is the best, mixed with stable manure or cow-dung. Sow two or three seeds in a spot in the garden, where they can have the sun shining on them for the greater portion of the day. When they have grown up to five or six inches, pinch off the top of the main shoot, and allow them to grow up a trellis work of bamboo or wood.

If the small red beetles, so much their enemy in the plains, attack them, scatter wood ashes over the leaves, or, which is better, but more expensive, get some cheap coarse mosquito net, which can be obtained in most bazaars, and spread it over the plants. They do best in the plains (of the English varieties) when sown in October or earlier if the rains are over. But the English sorts are mostly all difficult to deal with in the plains.

The frame varieties are most difficult to rear.

The fine English varieties are far the best, such as *Blue gown* and *Telegraph, Dreadnought, Marquis of Lorne, Tender and True.* These are far superior in flavour to the native varieties, but are more difficult to rear. Hardier varieties of cucumber are the Ridge sorts, *Bismarck's Green, Long prickly,*

Bedfordshire Ridge, *Paris Gherkin* and *Long Athens*. Newer varieties selected by the Himalayan Seed Stores, Mussoorie, especially for this country, are Cucumber *Lockie's Perfection*, *New Giant White* or *Parisian Long White Ridge*.

DANDELION.—*(Leontodon taraxicum.)*

Nat. ord., Asteraceæ.

This plant of late years has been grown for the purpose of making salad. It has also been grown to mix with coffee. It should be sown in the plains in October and November both in Bengal and the North-West Provinces. In the hills sow from March to May.

It should be sown in beds, and thinned out to eight inches or a foot apart. When considered large enough the leaves should be gathered together, and then earth up all around, or earthenware tiles may be put together, and the earth thrown up round them to keep the tiles in position and close round the plant. When flower buds are produced they should be picked off. It makes an excellent salad when thus blanched, and is considered very beneficial in Liver complaints, which should recommend its use in India more generally, where this complaint is so prevalent. The seed is procurable from the Himalayan Seed Stores, Mussoorie, North-West Provinces.

ENDIVE.—*(Cichorium Endiva.)*

Nat. ord., Compositæ.

Native name, KASTA, KASNEE, or KUROO.

Sow the seed of Endive in Bengal from August to November, and in the North-West Provinces from September to November, in a soil of brick-dust or gravel. Plant out the seedlings when strong enough to handle, in beds a little raised, if the sowing has been early; if later, then plant in beds that have been sunk two or three inches, so as to allow of their being flooded with water. Place the plants 10 to 15 inches apart.

The soil should be well enriched with cow-dung and plenty of leaf-mould, and frequently watered with liquid manure. When of the proper size for use, the plants should be tied up pretty firmly, so as to admit of their being blanched. Before tying up the plants, care should be taken that the leaves are perfectly dry. Then place a flower-pot over them till perfectly blanched and fit for use. Too many plants should not be operated on at once, as they are sure to tarnish and rot by being long excluded from the air. It will take about a fortnight to blanch Endive properly, and during this period the pots should be removed and all moisture wiped from the inside of them daily, or the condensed air within will form into drops and tarnish the plants.

Successive sowings should be made of Endive; seed is easily obtained from this plant; it does not degenerate in this country so rapidly as some imported vegetables. There are two kinds of Endive, the *Batavian* or broad-leaved and the *Curled* or *Capuchin's beard*, and of each there are several varieties under different names, such as *Louviere*, *White Curled*, *Green Curled Rouen* or *Stag horn*, *Courte à cloche* and *Guilande*, all good varieties.

FENNEL.—*(Foeniculum officinale.)*

Nat. ord., Apiaceæ.

This plant grows almost like a weed in this country, and resows itself year after year. Sow the seed in the plains in September to October in Bengal and the North-West Provinces. In the hills sow the seed in April and May.

GARLIC.—*(Allium Sativum.)*

Nat. ord., Liliaceæ.

Garlic is much cultivated throughout the plains of India, and is therefore obtainable at a cheap rate in every village market, especially as it is one of the ingredients of curry, which is so generally eaten, and is the native national dish. The entire root is made up of several cloves or separate small

bulbs. These cloves are planted in October, and are separated and planted in sunk beds prepared for their reception; each clove being planted about six inches apart each way. The beds, as before mentioned, being slightly sunk or depressed are easily irrigated. The soil should be of a light nature and fairly rich. The crop should be ready to take up by about February or March, when the leaves are seen drying off. Then water should be withheld for some days and the roots dug up, well sun dried and stored away tied in bunches and suspended to a rafter or nail on the wall in the store house.

They are kept best in this way, or hung up in nets. I do not know of this plant being cultivated in the hills.

GINGER.—*(Zingiber Officinales.)*

Nat. ord., Zingiberaceæ.

Ginger is largely planted by natives in this country, and is grown in some places to great perfection.

When young the tubers are converted into an excellent preserve, quite equal to the Chinese preserved ginger in such places where it is grown so excellently.

In Mussoorie in the North-West Provinces the hillmen bring in ginger in a young state for this purpose from the valleys. The tips of the tubers when young are of a delicate pink color. In an older state the tubers, as we all know, are brownish, and are used for culinary purposes. The tubers are planted in rows or drills about a foot to a foot-and-a-half apart and three to four inches deep, in a light rich soil, and covered with earth. It should be planted in both the hills and plains during the month of May; and as it grows should be slightly earthed up. The earth round the roots should be well cultivated and dug, so as to be loose and allow of the expansion and growth of the tubers. The soil should be well manured with leaf-mould, especially if the soil is stiff.

Ginger is grown very largely both in the hills and plains of India.

HORSE-RADISH.—*(Cochlearia Aromatica.)*

Nat. ord., Moringaceæ.

In the plains, the roots should be planted in pieces the size of a quill, round the edge of a pot filled with mould and light soil, and watered till they sprout and form rooted plants. Then holes should be made for their reception about a foot-and-a-half deep, ten inches wide and a foot-and-a-half apart on some high ground. These holes should be filled with mould and light soil, and one plant should be planted in each of them. In a couple of weeks they will start growing: then dig down by the side of the roots and cut off all the lateral roots, leaving only the tap root, and fill in the soil again. This should be repeated at intervals each time, removing all the lateral roots further down at each several operation, otherwise the root will be a tangled mass of rootlets.

In the hills this mode of cultivation may be proceeded with, but is hardly necessary, as this plant grows most easily and forms good roots. The soil, however, must be deeply dug, should be light and manured with leaf-mould.

I am indebted to Mr. H. St. John Jackson for the above mode of cultivation of Horse-Radish in the plains.

HORSE-RADISH TREE.—*(Moringa Pterygosperma.)*

Nat. ord., Moringaceæ.

This tree is common in Bengal, Chittagong and many districts. The root of this when first washed and scraped, with a little vinegar poured over the scrapings, is not unlike horse-radish, for which it is an excellent substitute. The seed pods too, when quite young and converted into curry or boiled, is very good. Should the pods be too old they lose their delicate flavour, and are not only harsh to taste, but are very fibrous. The seeds of this tree may be sown during the months of June and July, or at the beginning of the rains. It is fast-growing and soon attains a height of 20 to 25 feet or more but it is best to have young trees and replace

them every few years, for the wood being soft and brittle, the branches are often broken by storms, and the tree gets unsightly with age.

INDIAN CORN.—*(Zea Mays.)*

Nat. ord., Graminaceæ.

Native name, MUKIE, GUNAIRA, BHOOTA.

Is easy of cultivation. The soil should be moderately rich, and well ploughed or dug some time previous to sowing. A succession may be kept up by planting at almost any time of the year in the plains, provided the plants are irrigated if sown during the dry season. In the hills sow Indian Corn in June or just as the rains set in, if not watered; but if you water the young plants they may be sown as early as April. However, seed sown just before the rains yields the finest crops.

The finest Indian Corn seed (of which there are many varieties) is got from America. The seeds should be sown about a foot-and-a-half to two feet apart; and as the plants grow tall and are liable to be blown over with the wind, or if they fall over with their weight of foliage, tie them together with their own leaves three or four plants together. This is in some cases very necessary (when the plants grow up too luxuriantly from an over-richness of soil). The best manure for Indian Corn is bone dust and some old cow-dung if the soil is poor.

If sown before the rains, the heads will be fit for use from the beginning to the end of September, some varieties being earlier than others, such as *Adam's Early* and *Extra Early eight rowed*. There are later varieties, which may be highly recommended, *viz.*,—*Tuscarora*, *Pennsylvania*, *White flint*; *Pennsylvania*, *Yellow eight-rowed*; *Mammoth Sugar*, and *Hickory King*, which latter is a very fine variety.

The Indian Corn-fields should always be kept free from weeds and well hoed, and a little of the earth thrown up at

the roots of the plant. This should be done at least three times while the corn is growing, and more especially after heavy rain, when the soil is dug sufficiently so as not to clod when worked.

Of the sweet or sugar corn kinds, or those mostly used for table, are the fine kinds which have been much improved—*Ne plus ultra, Henderson, Roslyn hybrid, New-red cob, Country Gentleman.*

The Native Indian Corn is very inferior to the American field corn, and still more so to the fine varieties of sweet corn mentioned in the last sentence.

JERUSALEM ARTICHOKE.—*(Helianthus Tuberosus.)*

Nat. ord., Compositæ.

Small tubers of this should be planted whole, just as potatoes are planted, in rows or holes, and earthed up six inches deep. They thrive best in a soil which is light and not very rich, and should be planted out in May in the plains. If sown either in rows or holes, the soil should be kept loose, and the tubers placed at least a foot-and-a-half apart.

The plants grow four feet or more in height in accordance with the richness of the soil. The edible part is the tuber, which, when boiled with milk, is considered a great delicacy. When the tubers are stored after the plants die off, they should be treated like potatoes, placed in sand, or they will shrivel up and become quite worthless either for seed or the table. They frequently grow to the size of a hen's egg, and some may be found larger, though the medium-sized roots are the best. In the hills the tubers should be planted in March or April, or as soon as the ripe tubers are obtainable. If planted early cover with manure or ashes.

The plants should be watered after the rains are over, and the soil gets dry; this should be done sparingly, and the ground be kept free from weeds and well dug, especially after watering, when dry enough.

KNOLE-KOHL, KOHL RABI OR TURNIP-ROOTED CABBAGE.—*(Brassica Oleracea, Caulo-rapa)*

Nat. ord., Cruciferæ.

Native name, OLE-KOLE or GAITE KOBEE.

Sow Knole-Kohl seed in Bengal from August to October, and in the North-West Provinces in September to November. On the hills sow Knole-Kohl seed from February (under cover) and in March up to May. It may be sown again profitably from August and September (under cover) and in October. At low elevations it may be sown in November.

Make the first sowings in the plains in pots, or, so as to be protected from rain, by *jhaups*, in raised beds. If later sowings are made, when there is no danger of rain, sow in open seed beds.

For raising seedlings, have a light soil, to allow the seed to germinate freely. When they have about four or five leaves, transplant them into sunken beds of very rich heavy soil, planting them from ten to fifteen inches apart.

They must be freely watered, and the roots must not be earthed up. Keep the plants carefully weeded, and the soil from time to time well stirred up. There are two sorts of this vegetable—the Purple and the Green,—both very much the same, except in point of color. Knole-Kohl is one of the earliest of European vegetables, and is therefore most acceptable.

It grows to an enormous size in this country, but is best when of a medium growth, after which they grow strong in flavour and become fibrous.

KURELA.—*(Momordica.)*

Nat. ord., Cucurbitaceæ.

This is a gourd very handsome in appearance when grown on a trellis. Its fruit is thickest at the centre and pointed at both ends, and is covered over the whole surface with blunt tubercles.

Being very bitter, it is not always liked by Europeans when served up as a vegetable curry. Prepared with the seed portion or inside scooped out, it is stuffed with sliced onions in which some dried green mangoe or tamarind is mixed. It is then tied up with thread and curried. The acid of the mangoe or tamarind does away with the bitter very considerably.

There are two varieties of this vegetable: one which Firminger mentions as "*Jethua*," probably the same as I have seen and heard called "*Bysakhi*;" as higher up-country it would bear fruit in the month of "*Bysak*." This pod or fruit grows quite 6 or 7 inches long or more, cultivated on the banks of the Ganges in rich aluvian. This is an annual. The other smaller variety "*Baramasia*," or translated in English means all the year round, is a perennial, and is sown in October, or just before the rains set in. The fruit is small, 2 to 3 inches long, and is used for curry chiefly by natives. The first named variety is sown in the cold season from October to the close of November on the plains. Light rich soil suits this plant best.

LEEK.—*(Allium Porrum.)*

Nat. ord., Liliaceæ.

Native name, GUNDUNA.

Sow the seeds of Leeks in November in Bengal, and in the North-Western Provinces in October, in beds richly manured with cow-dung and wood ashes, or ashes from burnt cow-dung, and mix sand with the soil largely to a depth of six inches or more. In the hills sow the seed in March to May, and at low elevations it may be sown again in October and November, especially on the lower elevations of the Darjeeling Hills from Kurseong and below that station.

When large enough, transplant into similar beds at about six to eight inches apart; in taking up the young plants care should be taken that the small rootlets are not injured, which would stop their growth. Keep them well-watered, and the soil always well stirred up. Occasionally add more ashes,

and earth up, but without pressing the earth firmly about the roots, as this prevents the edible portion of the plant from growing to the thickness it otherwise would attain. The kinds chiefly grown are the *London flag*, the *Ayrton Castle*, and a large variety called the *Musselburg*, or the *Scotch Leek*, which is much esteemed by many.

LETTUCE.—(*Lactuca sativa.*)

Nat. ord., Compositæ.

Native name, KUMA or SULAD.

Sow the seeds of Lettuce in Bengal from August to November, and in the North-Western Provinces from September to January. In the hills sow the seed of Lettuce from February (under cover) and in March up to May, and again in August to October. The late sowings will require protection during winter. Lettuce may be grown in boxes almost all the year round, but of this I will treat further on: at present I will only deal with the usual method of growing it. There are two sorts—the *Cos* and the *Cabbage*, the former being of more erect growth than the latter: both are treated in the same way.

The best soil to sow Lettuce in is an open soil, well drained and light. When the plants are about two inches high, transplant them into a soil of a light description well, enriched with leaf-mould (it can hardly be too rich). Water well, or rather swamp the plants. The Cabbage Lettuce requires more room to grow in than the Cos; plant the former fourteen or fifteen inches apart, and the latter twelve inches.

If planted out early, use raised beds; if later, sunken beds. Cos Lettuce when required for use should be tied up for ten days previously. If you can procure refuse indigo-stalk dust for manuring the soil for Lettuce, it is much better than any leaf-mould you can procure.

Frequently add liquid manure to the ordinary watering. Lettuce may be planted in boxes at almost any time of the year in the plains in the same way as in sunken beds, leaving

a little of the box edges above the soil. Shade from the sun after 9 or 10 A. M. if it be very powerful; also from heavy rain, though a slight drizzling shower will do them good. Should there be strong westerly breezes during the hot weather, when you are rearing them, have mats to the windward of your shed to protect them from it, and water freely.

When Lettuce is grown out of season it should be used rather younger than when it is in season, as it is bitter when allowed to grow too old. I have grown very good Lettuce in this way during the hot months of the year. I would recommend the Cabbage Lettuce for this purpose.

There are many varieties of both the Cos and Cabbage Lettuces,—very excellent if true to their names. Of the Cabbage varieties, *Albanian Cabbage*, *Buttercup*, *Bonde Blockham*, *Guenezzano*, *Marvel* or *red*, *Besson*, *Mussoorie Giant*, *Tender and True*, are good novelties, sold by the Himalayan Seed Stores, Mussoorie, North-West Provinces, who also have the new varieties of Cos Lettuce, *Victoria White*, *Giant Naples*, *Kingsholm* and *Jefferies little Queen*, and many other fine novelties.

LUFFA.—*(Luffa Acutangula.)*

Nat. ord., *Cucurbitaceæ*.

Native name, JHINA TORRIE.

This vegetable boiled is sometimes served up, and when quite young is agreeable to taste, especially when slightly fried after being boiled. It is also made into vegetable curry. When thoroughly ripe and divested of the rind, the fibrous substance is cleared of the seeds, and is then used as a sponge or friction towel.

The seeds are sown in the plains and at low elevations in the hills just before the rains set in. Its vines are generally allowed to trail over the ground, but are better supported on a trellis. The variety called *Gheea Torrie* has a smooth skin, and is used in the same way, as well as that it is sown at the same time.

MARJORAM, SWEET.—*(Origanum Marjorana.)*

Nat. ord., Labiatæ.

In Bengal, sow Marjoram seed in September to October or November; in the North-Western Provinces in September and October; in the hills sow in March to April, and again at the close of September and beginning of October; and put them under shelter, if there is heavy rain, till the plants are strong enough. When the plants are about six inches high, transplant them into beds of good rich garden soil: add leaf-mould if the soil is not rich enough, and sand if it is stiff or clayey. It requires shade, and must be watered about every seventh or tenth day. This plant is an annual. There are other varieties of Marjoram, such as *O. Onites* or the common Marjoram, which is a perennial; and *O. Heracleoticum* or Winter Marjoram (perennial); these varieties are sown at the same time as sweet Marjoram, the first-named variety, and are propagated by division of the roots and from cuttings. The soil should be enriched yearly.

MELON.—*(Cucumis Melo.)*

Nat. ord., Cucurbitaceæ.

Native name, PHOOTEE or PHOOT.

Few attempts to cultivate the European Melon, or even the Melon from Cabool, have succeeded in this country, though I have heard that some fine varieties have been cultivated at or near Poonah; but I do not know if these are at all equal to those just mentioned, or if they are the same. The Rev. Mr. Firminger mentions that "Mr. Chew, after many experiments attended with failure, succeeded at last in finding the treatment by which the Melons of Afghanistan might be raised in the locality of Calcutta with tolerable certainty of success." I have only tried twice to cultivate them, and failed completely; the first time from the seed being bad; on a second attempt the seed germinated freely, but the plants, after developing, died from some insect having attacked their roots when they were in flower.

The country melon is very inferior to the varieties above-mentioned, and the treatment for the European and superior sorts is quite different. I think the plan mentioned by Mr. Firminger, as being tried by Major Napleton, is the best, and it was the plan I adopted, when my plants (so nearly succeeding) were destroyed by insects :—" Dig a trench fourteen inches deep and two feet broad, and sow a double row of seeds in each trench. Train the plants along the dry ridge above the trench, so that they do not come in contact with the water. Sow the seeds in March in Bengal; and the latter part of April, I should think, would be the best time in the North-West Provinces. The soil should be clay with a small admixture of sand, and the compost used should be nearly half stable litter or cow-manure and half earth, well mixed and put into the trenches and pressed down pretty firmly.

Steep the seeds in hot water (bearable to the hand) for about twenty-four hours, and then put them into some wet sand or ashes till they sprout, which will be in two or three days; then sow them at about a foot apart in the trenches in double rows an inch-and-a-half deep. As soon as they appear above ground " deluge them with water every evening till they are two inches high." It must be borne in mind that the plants must not be watered when they are flowering, and that when the fruit has appeared they must be freely watered again until they are just ripening.

The spot chosen for the cultivation of Melons should be well exposed to the sun. These plants are much infested by small red beetles, which should be excluded by drawing a mosquito net over the plants, for if ashes be used it prevents the healthy growth of the plant, which is so tender that it requires the greatest care.

The fruit is considered ripe when the stems wither, and should be cut off then. Notwithstanding the trouble that it requires, it will amply repay the cultivator should he succeed.

I should be inclined to favour the American seed more than any other, as being the most suited to the climate of India.

I would strongly recommend the lover of gardening to cultivate the Melon, if he can devote a portion of his time to it himself, as few native gardeners will take the trouble or pains necessary to make them grow satisfactorily.

The best time to sow melons in the hills is in March, April or May.

MINT.—*(Mint* or *Spearmint.)*

Nat. ord., Labiatæ.

Mentha viridis and *Mentha piperia.*

Native name, PODINA.

That which is commonly grown in our gardens, and is so useful for culinary purposes, is a totally different plant from *Mentha piperia* or *Pepper-mint*, though it resembles it in some degree. The leaf of the former is much rounder, with an uneven surface, that of the latter being much smoother. It has a much stronger and finer flavour than *Mentha viridis*. Both take easily from cuttings with some roots attached to them if put down during the cold season: especially *Mentha viridis*, which may be put down at almost any time if shaded and watered well. Seeds of both may be sown in the plains in October and in the hills in April and May.

MUSHROOM.—*(Agaricus-esculentus.)*

Nat. ord., Thallophytes.

The propagation of Mushrooms has been little tried in India, though they could be reared with facility. The varieties generally eaten are *Agaricus campestris* (the common Mushroom), and several varieties of the same, *Agaricus Georgii* and *Agaricus oreades*, the last being the highly esteemed *champignon*.

There are many poisonous descriptions: I quote from "Beeton's Universal Information," who explains most clearly how they may be distinguished:—

Edible Mushrooms.	Poisonous Mushrooms.
1. Grow in dry places.	1. Grow in clusters in woods and dark places.
2. Generally white or brownish.	2. Usually with bright colors.
3. Have a compact brittle flesh.	3. Flesh tough, soft, and watery.
4. Do not when cut change color by the action of the air.	4. Acquire a brown, green, or blue tint when cut and exposed to the air.
5. Juice watery.	5. Juice often milky.
6. Odour agreeable.	6. Odour commonly powerful and disagreeable.
7. Taste not bitter, acrid salt or astringent.	7. Have an acrid taste.

Choose an out-house for their propagation; put up some shelves, place a mixture of horse, cow and sheep's dung well mixed with some light sandy soil, add some pieces of Mushroom spawn, and press the whole down firmly. The heat of the bed should be about 70°. The room should not have too much light, and the floor of the out-house should be watered (not the shelves with the spawn on them).

To grow Mushrooms in pots or boxes, the dung is prepared by turning it over five or six times and then adding some light soil and a little salt. When well worked, fill the pots or boxes to about an inch from the surface and press down firmly, lay in pieces of spawn and cover with light soil; keep the pots in an out-house with not too much light. This method will be found less troublesome than that first described, although, perhaps, not so good. They may be grown in beds too in the same manner.

In Bengal, Mushroom spawn should be planted about the end of November or beginning of December; in the

North-Western Provinces up to February, and in the hills in March and April in beds, and in an out-house in May and June.

There is no certain plan of procuring Mushrooms; but the above mentioned is as certain as any method yet known.

ONION.—(*Allium cepa.*)

Nat. ord., *Liliaceæ.*

Native name, PEEAJ.

The cultivation of the Onion from imported seed of European varieties is attended with some difficulty, owing to the seed frequently not germinating; it is therefore necessary that it should be obtained as fresh as possible.

A light soil is decidedly the best, and especially the light soil sometimes seen on the banks of the Ganges called by the natives of Behar "Ghuksee."

The mode of planting used by native gardeners is highly prejudicial to the European Onion, or any other kind.

They generally make a puddle of the beds they are going to plant the seedlings in, and then pulling them up plant them into it. This causes the soil to become stiff when it dries: besides, pulling up the plants breaks their rootlets, and materially interferes with their growth.

In the hills sow Onion seed in March and up to May.

Sow the seeds of Onions in October in Bengal, and in the North-West Provinces in September and October, in beds manured with cow-dung and wood ashes, and when large enough to handle, plant them into square sunken beds of about four feet, and see that these beds are well mixed with sand if the soil is in the least stiff; also manure them well with wood ashes, cow-dung ashes, and bone-dust, if you can procure it.

In taking up the seedlings care should be taken to dig them out without breaking their rootlets, and plant them, not covering the portion which will form the bulb. When the soil is dry enough, after each watering (which should be

frequent and copious), stir up the soil with a *khoorpee* or trowel, and pulverize it with the hands, keeping the earth away from round the bulbs.

The larger sorts of Onions, such as the *Tripoli* and *Portugal*, should be planted a foot apart, and the smaller sorts, such as the *Silver-skinned*, only at six inches. It is very necessary that the soil be kept loose and away from the bulbs to allow them to grow.

In preparing the seeds for sowings, one good plan is to keep them for about two hours in water a little too hot for the hand to bear, then, after draining off the water, let them dry for two hours, and sow the seed-beds.

Onions should be taken up when their leaves show signs of withering, when water should be completely withheld for a few days before they are removed for storing.

If for use, keep them in sand; but should you desire to obtain seed from them, put a few into nets and hang them in an airy place, and they will keep best by this method till planted.

There are many sorts of Onions, red, brown, white, and yellow; the best varieties being:—

1. *White Spanish* (the mildest in flavour).
2. *Deptford* or *Brown Spanish* (a good storing variety).
3. *Brown Globe* (hardy, and useful).
4. *White Globe* (keeps well, and is mild in flavour).
5. *Silver-skinned* (small; good for pickling).
6. *Blood red* (hardy, and very useful).
7. *Giant Madeira* (very large, and particularly mild in flavour).
8. *Tripoli Large flat Italian* (a useful variety).
9. *Tripoli Large Globe* (a good variety).

The first, and the three latter varieties, I would recommend as being the best suited to the climate of the plains

of India, of the older kinds. Novelties *Neapolitan Maggiajole*, *Mammoth Pompeii*, *Mammoth Silver King*, and *Prize Taker* are procurable from the Himalayan Seed Stores, Mussoorie, North-West Provinces.

PARSLEY.—*(Apium Petroselinium.)*

Nat. ord., Umbelliferæ.

Native name, CHUNDNEE, AJMOOL, PITTASILLI.

Sow the seeds of Parsley in Bengal in August and September, and in the North-West Provinces in October. In the hills sow Parsley in February, March, April and May, and again in September and October.

Steep the seeds for two or three hours in hot water, then allow them to dry for about the same number of hours, and sow in boxes. If the rains are not quite over, protect the boxes from heavy showers by a small shed of mats. If sown later, the seed may be put in beds richly manured with cow-dung and leaf-mould. When the plants are about three inches high transplant them to beds manured with the same description of compost as before mentioned, placing them about six inches apart. Irrigate them once a week or once in ten days, and keep the plants free from weeds.

The best varieties of Parsleys are the Curled Parsleys. This plant is perennial; but in this country, in the plains, it is nearly sure to die off if not taken up during the hot months and placed in boxes under shade: should the plants be left in open beds during the months of April and May, and yet live, they will be certain to be killed by the rains further on in the season. In the hills it is easily kept alive if protected from the heavy rains and in winter.

PARSNIP.—*(Pastinaca Sativa.)*

Nat. ord., Umbelliferæ.

Native name, GAZUR, ISTUFBEN.

This vegetable is worthy of being more cultivated in this country than it now is, as it grows well, and is an acceptable

addition to other vegetables grown for table purposes. The soil which suits it best is of a light nature, and sandy, mixed with cow-dung and stable manure. The plot for it should be well and deeply ploughed, and freed from all clods and bricks or gravel, also exposed well to the sun all day, as shade does not suit Parsnips. Sow the seed broad-cast, and thin out the plants first to four and then to eight inches apart. Water, as for Carrots, pretty copiously.

The time for sowing, in Bengal, is during the months of October and November, and up-country or the North-West Provinces, in September or October. In the hills sow the seed in March, April and May.

PEAS.—*(Pisum Sativum.)*

Nat. ord., Leguminosæ.

Native name, MUTTUR.

Of Peas there is an endless variety of both the tall and dwarf kinds, as well as a sort of which the entire pod is eaten. All the varieties of European Peas do well in this country. The soil they prefer is of a light nature, and it should not be manured, unless very poor; the dwarf kinds require a richer soil, and a little leaf-mould may be added to it.

In Bengal, Peas may be sown as soon as the rains are over, say from the middle of September to the end of November, and the same will apply to the North-West Provinces: but before sowing, care should be taken that the rains are well over, as the plants are liable to be destroyed by any excess of moisture, especially when very young. In the hills the seed may be sown from February to May, or even later, and again in August to September and October. One pound of Peas will sow a row 40 to 50 feet long.

Sow them in double rows, each row being about two-and-a-half feet apart for the dwarf kinds, and three feet for the tall-growing varieties; and each Pea should be sown about an inch or an inch-and-a-half apart in these rows. The

tall-growing Pea-seeds should be planted two inches deep, and the dwarf varieties from an inch to an inch-and-a-half deep (not more). Soak the seeds in warm water for about two hours, and then let them dry for about the same time, after which they may be sown. Water them once when in flower but not after that, and even then they should be watered only slightly. When West-winds are very strong in the plains, perhaps a slight watering may be given judiciously to late sowings, especially when the plants seem drooping. A larger crop of Peas may be obtained, after they have given their second set of flowers, by pinching off the leading shoots, which will also increase the size of the Pea Peas do better in a spot partially shaded, where they are not exposed to the sun's rays all day. Sticks should be put up for them when they are about a foot high, making the sticks of the rows cross each other at about a foot from the top, and tying them together.

Peas should be cut off, and not pulled off, as is frequently done by *mallies*, as they are injured when uprooted in that way. Peas are easily acclimatised, and do not deteriorate for years, if at all.

Peas (the dwarf kinds especially) can be brought to bear at almost any time of the year, especially in the hills, by sowing them in boxes covered with movable sheds, such as are mentioned in General Instructions, Chapter X. Shade from strong sun, from 10-30 A.M. to 3-30 or 4 P.M., in the hottest months, and also put up mats on the windward side of the shed, to protect them from severe West-winds. Water too, at such a time, a little more generously, and see that the boxes in which the Peas are sown have a layer of gravel at the bottom of them for drainage. Should this experiment be tried during the rains, the sheds will be brought into use chiefly to protect the plants from rains, and not so much from the sun, though they should be used for that purpose too if the sky remains clear and unclouded, or if the

sun is very powerful. Some of the best varieties of Peas are included in the list below:—

EARLY PEAS.

American Wonder ...	... 1	foot high.
Early Sunrise ...	... 2½	feet ,,
Earliest of all ..	.. 2	,, ,,
Extra early Premium Gem	... 1½	,, ,,
McLean's little Gem ...	.. 1	foot ,,
William the First ...	.. 3	feet ,,
Carter's Lightning ..	.. 2½	,, ,,

MAIN CROP.

Dr. McLean ..	... 5	feet high.
Champion of England ..	.. 5	,, ,,
Duke of Albany ...	... 5	,, ,,
G. F. Wilson ...	... 3	,, ,,
Hairs dwarf Mammoth ...	... 2½	,, ,,
Laxton's Evolution ...	... 3 to 3½	,, ,,
Pride of the Market ...	... 2	,, ,,
Telephone ...	.. 5	,, ,,
Veitch's Perfection ...	... 3	,, ,,
Yorkshire Hero ...	... 2½	,, ,,
Yorkshire Gem ...	... 3	,, ,,

LATE CROP.

British Queen ...	... 6	feet high.
Emperor of the Marrows	... 6	,, ,,
Ne Plus Ultra ...	. 6	,, ,,
Omega ...	... 2½	,, ,,
Sander's Marrow ...	... 5	,, ,,

NOVELTIES are *Autocrat*, *Celebrity*, *Conundrum*, *The Duchess*, *Duke of York*, *Exonian*, *The Gladstone*, *Sensation*, *The Stanley*, and *Laxton's Supreme*.

POTATOE.—*(Solanum Tuberosum.)*

Nat. ord., Solanaceæ.

Native name, AHLOO.

This is undoubtedly the most valuable edible tuber our fields and gardens possess, nor is there any vegetable more generally consumed by Europeans. The cultivation has much increased in India, more so in some districts than in others: for instance, in Behar it has increased, and there are few villages (especially those not liable to the inundation of rivers) that do not grow it more or less. In the hills too it is grown, more largely in the North-West and Punjab. Notwithstanding this rapid increase of so valuable an article of food, very little pains have been bestowed in procuring good imported varieties, and seed imported and grown has been repeatedly kept on, till in many instances it has degenerated from want of care in cultivation.

In case of the rice crop failing, nothing would so well supply the deficiency as the Potatoe. Generally speaking, the Potatoes grown by natives are of inferior varieties, though in some instances they have procured a good description, especially in the hills, where some superior varieties have been supplied to them by Government: this has, however, in many instances deteriorated, as I have before mentioned. The best manure for Potatoes is old stable manure, wood ashes, lime, and bone-dust ploughed into the field to be sown. The quantity of manure supplied should be regulated by the richness of the soil, and the same spot should never be cropped two successive years. The soil best suited to Potatoes is of a light description.

To grow large Potatoes, the whole tuber should be planted, and large Potatoes also should be chosen for seed. The root, as it decays, furnishes food for the halm before the young tubers are formed, and before it has sent out shoots itself underground to produce them. In Bengal, Potatoes should be planted in September and October; in the

North-West Provinces in July and August, and in hill-stations during the months of January, February and March (a good deal depends on the locality). Plant the seedlings of large imported varieties in trenches twenty to twenty-four inches apart. If you are desirous of saving manure, only manure the trenches, and not the whole field. The trenches should be eighteen inches or two feet apart. The end of the Potatoe having the greatest number of eyes should be placed uppermost.

After planting, earth up; and as the halm grows, continue earthing up from time to time. Careful earthing up is essential to the production of a good crop, besides keeping the earth loose on and in the ridges when the tubers are produced. Water sparingly, perhaps not more than twice or thrice during the whole growth of the plant, and after each watering loosen up the soil well. Care should be taken that none of the tubers are exposed, for in such case they are certain to be discolored, and would be an evidence of careless cultivation. Potatoes should never be taken up for storing until the halms have quite withered and dried, otherwise they are sure to be destroyed by rotting. Young agriculturists, anxious to see the result of their labours, are liable to fall into this error from curiosity, and thus, to their vexation, lose a great deal, blame the seed, and get disheartened.

Few crops give a better return than the Potatoe. I have myself seen a return of no less than from 80 to 100 maunds per bigah of land at a small village not far from the Colgong railway station on the East Indian Railway line. The cultivation there was carried on by natives on their own account, according to the ordinary method, and without even manuring the soil. However strange this may appear, there is a way of accounting for it. The spot cultivated was strewn over a considerable distance with old refuse mortar, and portions, or I should say the larger part of it, had years ago been covered with refuse indigo stalks, which decayed there till it turned to a black soil, and the rains

falling on this, and running over the soil, must have manured a greater portion of it than the refuse indigo stalks themselves occupied, thus making it very rich. The variety of Potatoes grown there was of a white description, very fair for table purposes, though not so good as could have been produced from European seed. They were about the size of a turkey's egg—some larger and some smaller. This shows that, however inferior the variety, the yield was large, and the soil therefore was well suited for the growth of the tuber. The use of slaked lime, bone dust or bone meal and old mortar pounded fine is highly desirable for the Potatoe. I would also recommend leaf-mould to be tried, if refuse indigo stalk cannot be procured. Whatever manure is used (either leaf-mould, cow-dung or stable litter), it must be old. The addition of wood ashes is also desirable. Care must also be taken that the soil is well drained; should it not be so, the leaf will look diseased and curled. There are many fine varieties of Potatoes that might be recommended, but are not always procurable from seedsmen in this country: so most frequently one has to put down such varieties as can be obtained: unless they are ordered by the amateur from England, Australia or the Continent.

ROUND AND PEBBLE-SHAPED VARIETIES.

Good varieties are—

Cannell's come-to-stay.
Early Regent.
Harbinger.
Snow ball.
White kidney and *oblong varieties.*
Bele de Fontenay.
Early Laxton.
Ringleader.
Rivers' Royal Ash-leaf.
Early Puritan.
The Gentleman.
Lily White, and many others.

PUMPKINS.—*(Curbita maxima.)*

Nat. ord., Curbitaceæ.

Native name, KUDEMA, LALL KOOMRA.

The native name for the orange-yellow or red-fleshed varieties is "Kudema." The English, or imported varieties, which come to us chiefly from the South of Europe, and more largely from America, should all be sown in the plains about the beginning of the rains, and in the hills from March to June. The soil should be rich, and the vines should be trained over a trellis or grown over some out-house.

When the flowers do not set, the ends of the vines should have their ends pinched off: in fact it is best always to pinch out the tops as soon as a few flowers appear, and again later on if they do not set. Good English and foreign varieties may be procured from the Himalayan Seed Stores, Mussoorie, North-West Provinces. *Pumpkin Golden Oblong, Japanese Pie, Banana, Quaker Pie, Small Sugar, Large Cheese, Cashaw Crook Neck, St. George* are all good varieties.

Native kinds are inferior to the above. The native white-fleshed Gourd called "Chalkoomra," *Benicasa cerifera*, and Bottle Gourd or Fakeer's Bottle, "Lowkee Kudo," *Lagenaria vulgaris*, are useful for making preserve or for candying. Boiled they are insipid. They are better made into curry. The seeds of both these varieties should be sown in May or June.

Cucumis utelissimus or "Kukree" of the natives is much grown on the banks of the Ganges in new alluvian soil, where the seed is sown at the close of the cold season. It is sometimes used in the place of cucumber, to which it is much inferior, but being earlier is acceptable.

The Snake Gourd, *Trichosanthes anguina*, or "Chichinga" of the natives, fruit green with greyish green stripes, is a coarse-flavored vegetable chiefly used for curry. The seed is sown during the months of May and June.

Trichosanthes, native name "Puleval" or "Pulwal," is a nice vegetable boiled, then fried, or only fried in butter. It has

then a nice sweet flavour if not over-fried. It is also used in curries. Its vines are planted during the rains in the form of cuttings, and soon root. The seeds are also sown in June and July.

RADISH.—*(Raphanus Sativus.)*

Nat. ord., Crucifera.

Native name, MOOLEE, MORIE.

Radishes may be sown in Bengal and the North-West Provinces from August to January, and in the hills from March right on to September or October, but during the rains they must be sheltered from part of June to August. The soil should be well enriched. Dig deep, especially for the long-rooted varieties. The soil should be well freed from all bricks, gravel or clods. For manure, use stable litter incorporated with the plot, after first digging the land well. It is quite a mistake to think that Radishes worthy of the name can be grown in even moderately rich soil, yet it is curious that good gardeners should make this mistake. Sow thinly broad-cast or in drills ; a little more room being allowed for the long-rooted varieties—four inches for the turnip-rooted and six inches for the long kinds. They should be well watered, and the earth kept loose by the use of *khoorpee*, trowel, or hoe. Radishes take about three weeks to be fit for the table, if properly treated, and should be grown on rapidly to be of good and not too pungent flavour.

The sowings made after the 15th or 20th September in Bengal will be found the best, as also those made about the beginning of October in the North-West Provinces. There is a great variety of Radishes, the best being—

Long Scarlet (short top).	*Yellow Globe.*
Long Scarlet (strap-leaved).	*Golden Globe.*
White Turnip-rooted.	*Olive-shaped white and red.*
Red Turnip-rooted.	*Radish new rose gem.*

There are two indigenous varieties. These are sometimes found very fair, and at other times rather insipid,

sometimes pungent; and they have not the flavour of the English vegetable.

Imported Radish may be brought to seed occasionally if sown pretty early; the tops cut off with about half an inch of the root, and planted in soil well manured with leaf-mould. Flood them with water every third or fourth day. The tops should not be planted till the Radish is unfit for table purposes.

RAM'S-HORN, ACHRO OR LADIES' FINGERS.—
(Abelmoschus Esculentus.)
Nat. ord., Malvaceæ.
Native name, DHARUS.

There are several sorts of Ram's-horn of both the tall and the dwarf-growing kinds. Generally the dwarf species, being the earliest, is preferred. It is well known in India to both Europeans and natives, but is sometimes disliked for its gum-like juice; I dare say it would be much more in request if it were known that this can easily be got rid of by adding a little lime-juice to the water the vegetable is being boiled in a few minutes before removing the pot from the fire, which makes it very agreeable. The plants bear a large yellow flower. The seeds should be sown both in Bengal and in the North-West Provinces in June up to August. In the hills it only grows well at the lower elevations, and is best sown in April and May. Any rich soil will do, in which make drills three feet apart, and drop a seed or two at every two feet in the drills. The pods should be used when not too old, otherwise they will be stringy.

An excellent fibre is made from the stalks of the plant for rope or twine.

RHUBARB.—*(Rheum Hybridum.)*
Nat. ord., Polygonaceæ.

In Bengal, the North-West Provinces or Punjab any attempt to cultivate Rhubarb will prove a failure; but in hill-stations Rhubarb seed may be sown broad-cast in March to May (a good deal depends on the elevation of the locality

influencing the climate). The plants should then be left till the following spring. You will then be able to judge of the earliest. Excellent Rhubarb is grown in Darjeeling, Mussoorie and Simla, quite equal to that seen in England. In the following way it may be forced. Place a tub or large pot over the crowns in December, and having previously prepared and shaken out the dung or litter, and got it into a condition to maintain a moderate heat, cover up the pots to a thickness of about three feet from the ground. Too large a quantity of dung will engender too great a heat and spoil the crowns, so just enough should be placed over the pots to cause a moderate heat.

Some gardeners cover with leaves, which, however, harbour vermin, which collect in numbers among the leaves and do mischief to the plants, though in other respects it answers the purpose of dung.

Rhubarb will grow without forcing, but it is far better forced than otherwise. The best varieties for forcing are to be procured from the Himalayan Seed Stores, Mussoorie, North-West Provinces. Nothing more is required than to cover with large pots, which are covered again with stable manure; but when grown in a frame, as is done in England, there is no necessity for the exclusion of light, which blanches it, by which no advantage is derived. As the plants grow, a good deal of manure should be worked into the soil. If you wish to plant them regularly, and increase the number of plants, take up the strongest roots and divide them, planting them from four to four-and-a-half feet apart.

Every part that has a crown to it will grow. As soon as you have done pulling the leaves, more manure should be dug in about the roots.

SAG.—*(Amaranthus oleraceus.)*

Nat. ord., Amarantaceæ.

There are an immense number of different sorts grown in India. These are generally sown in May, June and July in the plains, but are seldom cultivated in European gardens.

Almost if not all of them may be sown from May to September *thinly in rather rich soil.*

Some sorts of Sag, such as *A. Giganteus*, grows tall; of this the stem is used, boiled and served up in the way of beans.

Firminger mentions, quoting from Dr. Roxburgh, *Viridus*, the common green Sag; *Ruber*, with rusty-colored leaves, bright red branches, petioles, nerves, veins and stems; and *Albus*, with white stems; but there are a great many varieties and species. It is seldom grown on the hills, and then only at low elevations, where it is sown in April and May.

SAG.—*(Amaranthus Gangeticus.)*

Nat. ord., Amarantaceæ.

Lall Sag of this country varies much in color, from purplish green to bright crimson red. The brightest colored varieties are considered the best. The seed of this is sown from May to September or October in the plains.

It is not grown on the hills, except at low elevations. Sow thinly in beds of light rather rich soil in the plains. If too thickly sown thin out the plants. For use pluck the leaves, and the plants will go on bearing a long while.

SAG.—*(Basella Cordifolia* and *B. Alba, etc.)*

Nat. ord., Basellaceæ.

Malabar night shade, *Poé Sag.*

This climbing Sag may commonly be seen growing up near and at the huts of villagers in Bengal, especially where it is much esteemed by them. It may be propagated by cuttings; and the seed is sown from June to August in the plains.

I have not seen it grown on the hills. The leaves are used boiled and then fried in butter slightly. The stems too are boiled and then slightly fried in butter. *B. Alba* is like *B. Cordifolia* but for the variegation of the stem and leaves.

SAGE.—*(Salvia Officinalis.)*

Nat. ord., Labiatæ.

Native name, SYSTEE.

The herb known by our *mallies* as "*Systee*" is a very good substitute for Sage, but is really *Meriandra Bengalensis*, and many Europeans call it Sage. Foreign varieties do not stand the rains and hot weather of this country in the plains, and are generally treated as annuals.

Sow the seed in Bengal and the North-West Provinces in September and October, in rich beds of light soil. On the hills sow the seed in March and April. Gather all straggling branches so as to keep the plants as compact bushes. The European varieties have a milder and more delicate flavour than the species usually grown in our gardens. In making sowings of Sage, shade from sun and rain till the plants come through, and are strong enough to stand a shower of rain; they may then be exposed to it, only in moderation. If you propose keeping the plants through the rains, the best plan will be to have a few of them in pots, so as to be placed under cover conveniently, but it is best to treat them as annuals, and pull them up in April or May and dry them, for they require great care. In the plains February is the best time to transfer the seedlings from the beds in which they were sown to places they are to occupy permanently.

In the hills the plants must be sheltered throughout the rains.

SALSIFY.—*(Tragopogon Porrifolium.)*

Nat. ord., Compositæ.

This plant is little grown in this country, and the seed obtained from home is very uncertain of germinating. The seeds should be sown in Bengal and the North-West Provinces in September and October, in a deeply-ploughed well broken soil free of clods and gravel; sow in drills, and then thin out to four inches apart.

It cannot be grown satisfactorily in Bengal, owing to the cold season being so short, but it does fairly well in the

North-West Provinces, and also in hill-stations, where it should be sown in March and April.

The drills should be at least six inches apart, and future treatment should be much the same as that for Carrot.

I would recommend the plants to be kept for seed, owing to imported seed being so uncertain of germinating. It is called the oyster plant from the supposed resemblance to it. The root is the edible part, and is boiled and served up with butter.

SCORZONERA.—*(Scorzonera Hispanica.)*

Nat. ord., Compositæ.

The treatment for this plant is the same as that for Salsify, only a richer soil is requisite. It grows freely if the soil is light, well dug and enriched. In some cases it is not fit for use till the second year. Imported seed is requisite. (See SALSIFY for cultivation.) This plant is known as the oyster plant. Its roots are black and require to be scraped before being cooked.

SEA-KALE.—*(Crambe Maritima.)*

Nat. ord., Cruciferæ.

This does not succeed well on the plains, where it is sown during the months of October and November, but not being able to stand heat, it soon perishes on the approach of hot weather. In the hills it should be sown in February to May, and again in September and October.

It enjoys a rich light soil in which leaf-mould is largely incorporated. When large enough invert *nands* or large flower pots over the plants to blanch them.

SHALLOT.—*(Allium Ascalonicum.)*

Nat. ord., Liliaceæ.

This is a useful esculent of the Onion tribe not often cultivated in Indian gardens, though it should be so. The cloves are planted out in the hills in the months of March to May, and in the plains in October.

The soil should be light and fairly rich and the cultivation just the same as that for Garlic, the soil round them

being kept well cultivated and loosened up so as to give the bulbs room to expand and grow freely.

When the bulbs are matured they may be dug up and stored away in the same way as Garlic or Onions in a ne suspended to nail or rafter.

SPINACH.—*(Spinacia Oleraceæ.)*

Nat. ord., Chenopodiaceæ.

Native name, ISFINAGE SAUG.

There are several varieties of European Spinach seed imported to this country, of the prickly-seeded and round-seeded varieties, all of which are cultivated for their leaves.

Sow the seeds thinly in October in Bengal, and in the North-West Provinces in October and November, and in March to May in the hills, and thin the plants out to about six inches apart. Any garden soil will do if manured well. The outer leaves only should be gathered, and those in the centre left for future pickings. By this method the plants last out much longer, and yield much more than they would do if the centre leaves were picked at once. In the hills it may be sown again in September and grown on rapidly, applying frequent waterings of liquid manure. Good varieties are *Bloomsdale Victoria, New Zealand, Monstrous Viroflay, Long standing round* and *Prickly Winter.*

There is also a variety of oval-seeded Spinach, which is seldom imported: the treatment for it should be the same as that for the round and prickly-seeded.

SQUASH.—*(Cucurbita Melopepo.)*

Nat. ord., Cucurbitaceæ.

Native name, SUFRA KOOMRA.

This vegetable grows well, either planted in pits filled with prepared soil, or in any ordinary garden soil well manured with cow-dung, stable litter, or leaf-mould, or a compost of all three in equal quantities. Sow the seeds of Squash in

Bengal in October and November, and in the North-West Provinces in February. On the hills make sowings of it in April, May and June. Plant two seeds together in case of one not germinating; each pair of seeds being four feet apart from the next pair. Have a small trellis for them to grow over, for, should they be allowed to cover the ground, the fruit frequently decays; besides the untidiness of the culture is an eyesore, whereas, when the plants have a trellis to grow on, their fruit is quite an object of beauty.

There are several varieties of Squash, and I may here say that the *Bush Squash* requires no support, whereas the *Lima*, or *Cocoanut*, and other sorts do. They are sometimes infested with the red beetle, which preys on their leaves, but as they advance in growth, these leave them, and they assume a healthy appearance and flower abundantly. Should the flowers be considered too many for the plant, some should be pinched off to allow the fruit to be of a proper size. Some of the best sorts are *Bush Golden Custard*, *Mammoth Chili*, *The Fordhook*, *Brazil Sugar*, *Early Prolific Marrow*, *Early White Bush Scalloped*, *Hubbard's Cocozelle Bush* and *White Pineapple*. The Himalayan Seed Stores, Mussoorie, North-West Provinces, have always excellent varieties in stock.

SWEET POTATOE.—*(Batalas Edulis.)*

Nat. ord., Convolvulaceæ.

Native name, SUKKER-KUND.

This plant is an extensive trailer and goes on sending out roots, as its stems extend along the ground, of a rather crooked cylindrical form. It is a native vegetable commonly used by Europeans, sometimes as a substitute for potatoes and at others for variety. They are used boiled or roasted for this purpose. It also makes an excellent pudding mixed with other ingredients. There are two varieties, one red and one with white tubers; the first is considered the best; perhaps because sweetest.

Both cuttings of the creeper, and more often the tubers, are planted to propagate it, which is easily accomplished during the months of June and July. The cuttings of the creeper are simply stuck into well prepared land about two feet apart and watered copiously. Likewise the roots are planted two feet apart. A light soil suits it best which is not too rich. It is not cultivated much in our gardens, as it can be bought so cheap in the market. The flowers of plant are handsome, pink with a purplish centre.

TURMERIC.—*(Curcuma longa.)*

Nat. ord., Zingiberaceæ.

Native name, HULDI.

This is so much used by both Europeans and Natives in India, that it is very largely cultivated for consumption in the making of curries. It is seldom cultivated in the garden, as it is so cheap and always procurable in the market places of every village. It is not grown in the hills, except at very low elevations and in the valleys. The tubers should be planted just before the rains in rows or drills from a foot to a foot-and-a-half apart. When they have grown eight inches or a foot high, the plants should be earthed up. The best soil for this plant is a light soil rich in leaf-mould. The tubers should not be taken up till the plants have dried up.

THYME OR LEMON THYME.—*(Thymus Vulgaris.)*

Nat. ord., Labiatæ.

It is difficult to keep this plant through the hot season. The treatment for it and most herbs is that described under the head of Sage. *(See* SAGE.)

TOMATO.—*(Solanum Lycopersicum.)*

Nat. ord., Solanaceæ.

Native name, BILATEE BYGUN.

In Europe great care is taken in the culture of the Tomato, yet in this country there is hardly a vegetable that

demands less care, and wherever it is sown it re-sows itself almost as a weed; yet it is deserving of attention, and is much improved by being well looked to. It is quite an ornament in the garden if grown on a trellis, where it yields in much greater abundance; whereas, when planted out in beds, it grows to be unsightly, and the fruit decays, besides being liable to be trodden on while being picked. Sow the seed of Tomato in Bengal in August to October; in the North-West Provinces from June to October in beds, and transplant to four or five feet apart, when strong enough to be handled. In the hills it should be sown early with some bottom heat, in February, and then the fruit has the chance of maturing well during the warm months and before the rains set in. This applies better even to the large fruiting varieties, which require lots of sun to mature and ripen. The great difficulty in growing Tomatoes at high elevations is the want of sun heat, which must be substituted by bottom heat, and they must have a sunny spot. From want of sun they sometimes will not ripen well. Sown early in February under cover, they may be planted out when the weather is warmer in March or even April. Light soil is the best for them, though they thrive very well in any soil that is rich. When large enough, put them into hoops, supported on sticks, about a foot-and-a-half high, or more; or train them on a trellis: by this method they will be ornamental as well as useful, besides allowing air and light to the plant, which is necessary to the production of sound fruit.

There are many varieties of Tomatoes, the smaller sorts being the *Currant*, the *Cherry*, the *Plum*, *Pear-shaped*, etc., and the larger sorts, which have been very greatly improved of late years both in size and shape. Many of them, now being devoid of the ribs, have a regular and even shape, hemispherical, round or oval. Good varieties are *The Trophy*, red. *The Shah*, a large yellow variety. *The Mikado*, a very large red, early. *Hathaway's excelsior*, a fine large red. *Chemine rouge*, fairly large, round, produced in clusters.

Challenger, large scarlet-red, round, a first rate variety, which has gained many medals. Grows in clusters. *Tomato the Apricot*, a fine variety with orange-yellow color and distinct flavour of its own. A medium sized round Tomato. *Early ruby*, very early, of crimson color and round. *Golden sunrise*, yellow. Some of these are novelties, and are procurable from the Himalayan Seed Stores, Mussoorie, North-West Provinces. New varieties are constantly being added to the already large number.

TURNIP.—*(Brassica Rapa.)*

Nat. ord., Cruciferæ.

Native name, SHALGUM and SULGUM.

Turnips of the garden varieties are often well represented in Indian gardens, yet they acquire a strong taste especially when warm weather sets in, or when not grown on quickly; therefore the earlier varieties are the best for cultivation in the Indian climate of the plains, as they are quick in growth and mild in flavour. Sowing of Turnips should be made in Bengal from the month of August to November, and in the North-West Provinces from September to January. They should be sown in drills (which will save seed), and after the plants have grown, thin them out to about ten inches or a foot apart according to the variety sown. Light soil well manured with litter or cow-dung is the best. Like all Brassica, it requires copious watering. The best varieties are:—*Early Snow-white globe*, *Early snowball*, *Extra Early Milan strap leaf*, *Half long red top Vertus*, which is somewhat of the shape of a stump-rooted carrot; *Large red top Globe*, *Moore's Warwick*, *Veitches red globe*, *Yellow Montonagny*, *Half long white forcing*. These may be obtained from the Himalayan Seed Stores, Mussoorie, North-West Provinces.

Seed may be saved from the Turnip by cutting off the top with about half or quarter of an inch of the root attached

to it, and planting it buried up to the green leaf stem in very rich soil, when it will seed abundantly if watered well.

The soil Turnips are grown in should be well dug, and quite free from stones, gravel, bricks, and even clods; it should also not be very recently manured.

YAM.—*(Diascorea.)*

Nat. ord., Diascoreaceæ.

There are a great number of varieties of Yams in cultivation in India on the plains. I have not seem them cultivated on the hills. Those chiefly grown are *D. Globosa*, or what is known to natives as *Choopree Alu*, not of much merit; but *D. Rubella* is a much better variety, *Gurineya Alu*. It has a reddish crimson exterior and is white within. *D. Fasciculata* is known to natives as *Soosnee* or *Sootnee Alu*, and is much cultivated in some parts of the plains both in Bengal and up-country: and is a good variety, white inside, and shaped something like a kidney potato. *D. Alata*, *Khum Alu* of the natives, is also a superior variety. Other varieties are mentioned by Firminger, but are little known and little grown in India, such as *D. Purpurea*, which is known as *Rukta Guraniya Alu*, mentioned as a good variety, with crimson-red outside and white within. *D. Atropurpurea*, Malacca Yam, which is much like Rubella.

The New Zealand Yam mentioned by Firminger as being more of a curiosity than of use or value, and which I have not seen, is, I presume, hardly known.

The ordinary way Yams are cultivated in India is: deep pits are dug two to three feet or more (very often in the beetel-leaf houses), these are filled with soil full of leaf-mould, and they are allowed to grow on pretty much without any further care, except that sometimes their vines are kept propped up, the roots are dug around and kept free from weeds. Even with this rude cultivation they grow to an immense size of some of the varieties. Generally they are

allowed to grow on till wanted for use or for market, sometimes not being dug up for over two years or more.

Properly cultivated pieces of the tubers should be put down in April or May in the plains, in a shady situation and in well manured holes a foot-and-a-half to two feet apart, and carefully dug and watered during dry weather. Being extensive climbers, the vines will require supports accordingly. *D. Fasciculata* should be cultivated just like potatoes, and the vines allowed to trail on the ground. It is very prolific and a most nourishing food. It is surprising it is not more largely cultivated by natives.

TAPIOCA.—*(Manihot utillissima.)*

Tapioca Manihot or *Cassava.*

Nat. ord., Euphorbiaceæ.

It is not much grown in this country, and is not likely to be cultivated in gardens, owing to the room the plants take up, growing tall and somewhat shrubby.

The root is exceedingly poisonous, but when pounded or grated in the same manner as directed for arrow-root, and then subjected to being placed on hot plates, is ridded of the poisonous properties.

Cutting should be placed in the ground during the rains, but will root at almost any time if well watered.

The roots grow to an immense size, and are very prolific. I have had it growing well on the border of my vegetable garden in Behar without any care.

CHAPTER XII.

DESSERT FRUITS.

HERE only describe the cultivation of the principal varieties of fruit trees for our Indian gardens, as there are many which are really not deserving of the name of edible fruits.

Much may yet be done towards the improvement of our Indian fruits; for as yet little skill has been bestowed on them.

Till quite lately little store has been placed on the fruit industry, which may some day prove of very considerable value to India. Even at present in some of the hill districts a considerable quantity of fruit is preserved, and ripe fruit is sold. In Kumaon there are some good orchards of choice fruit; but unfortunately the means of transporting it is wanting.

A field for European enterprise lies open at present of great value practically undeveloped, and I predict that when a branch railway or tramway runs up to Naini Tal or Kumaon, a new and thriving industry will be established there.

Along the Himalayan range there are most suitable places with congenial soil suitable to the growing of English fruits. The rainfall is great during the monsoons, but still good fruit are grown successfully.

Much may be done towards the practice of dwarfing trees by grafting on stocks of different but allied species, the advantages being various: *Firstly*, these dwarf plants occupy little room. *Secondly*, their bearing fruit earlier or later in season. *Thirdly*, improvement of fruit. Their roots are easily got at to be root-pruned, and when such trees have matured they could, when necessary, be sheltered from excessive sun or rain, or inclemencies of cold or heat.

The careful selection of stocks for grafting and budding is as yet to be carefully considered and understood by dealers in fruit plants in this country. Much of the success of the orchard depends on this; and it has as yet been very imperfectly understood or carried out in India, though of the greatest importance.

In England a system of biennial transplanting has been practised, at which period the roots have been shortened, or they have had their roots cut back annually, thus keeping the plants as dwarf as possible. The roots are especially prevented from penetrating deep into the soil which has not been prepared for them or is unsuitable.

I am of opinion that much also may be done in the improvement of fruit and increase of yield by the selection of stocks and the age of the stocks when grafted on. At a meeting of the Agricultural and Horticultural Society of India, on the 24th August, 1887, communications were received on the subject of grafting Mangoes from the Superintendent, Public Gardens, Allahabad, which were of considerable interest. By the method adopted (and which I quote) he says: "There is no difference whatever in the fruit to those grafted in the ordinary way; the trees however were a couple of years later in fruiting, but they are almost double the size of the other trees of the same age, and they more than made up for the lateness in fruiting by the extra quantity of fruit they gave the first two years in which they did fruit; they are also of a cleaner and stronger growth, and in all probability will give heavier crops as they go on."

In grafting there are two points to be careful about; *first*, to see that the seed is attached to, and has not fallen from the seedling to be used as the stock; *second*, to graft on the semi-hardened wood, that is, on the last growth of the previous year.

Such fruit as the Puneâla Plum *(flacourtia cataphracta)*, Lichee *(nephelium lichi)*, Longan *(nephelium longanum)*, Wampee *(cookia punctata)*, and several other fruits, are, I believe, subject to great improvement.

Improvement in horticulture and agriculture is now being exercised by men of ability. In days gone by little was done but by that of the introduction of plants at intervals, and that to a limited extent only.

In laying out orchards the greatest care should be exercised in giving sufficient room to trees to grow to their full size; the nature of the tree must be taken into consideration. This not only allows of the trees growing to their full size, but also a full play of sun on the trees to ripen the fruit is necessary and cause it to be of good color and flavour. It is quite out of the question to lay down any rule of thumb how far each tree should be from the other, for not only does each kind of fruit tree or shrub differ in spread, but that even applies to varieties, some being quite tall and spreading, others dwarf and compact.

In planting in all cases (of whatever fruit trees), having chosen your site and marking off the distance carefully from the adjoining trees which may be in existence, or that may be prospected to put down in future, a good deep pit 4 feet in depth and equally broad should be dug, and the soil be prepared and manured.

Care in this may make a difference of a year or two in the bearing of your trees, which is a most important point.

Be careful in the selection of your varieties, and select those you know will do well in the district or locality you intend them for. Look at your soil carefully, see if it is well drained, sandy or clayey, a soil full of moisture or a dry soil.

If the soil does not suit the variety of fruit tree you wish to grow, you must dig your pits deeper and broader and make the soil suitable, stiffer or lighter, or better drained and more or less manured. This is expensive. The excessive use of quantities of manure is to be avoided, as it only increases leaf yield and retards fruiting.

Not unfrequently the fruit does not set and the flowers fall off without yielding fruit, while sometimes the fruit falls off while immature.

Far better than overmanuring, when planting, is surface-dressing, and better still the use of liquid manure, which is quite under control and can be withheld when necessary.

To be commended, too, is the application of water when there is drought, by making holes with a crowbar all around the tree at a sufficient distance not to injure the roots and filling these holes with water. Underground watering tubes are also manufactured.

By this method less evaporation takes place, and your trees will benefit more than by surface-watering, when it may not penetrate sufficiently deep to do so much good.

The saving too of water is at such times a consideration not to be lost sight of.

Not unfrequently, private gardens especially are laid out at haphazard, and all the points I have mentioned above are completely lost sight of, or some of them are neglected and years of growth lost. Trees of inferior varieties are put down, or varieties unsuitable for the locality; or they are simply put down without any preparation of the soil, stowed away into any corner, close to other growing trees, and thus much time and labour is lost.

Such planting does not by any means enhance the value of the estate or property, which should be carefully and thoughtfully considered.

Fruit growing, like other things, requires careful study, consideration, and thought. What applies to other learning or knowledge is applicable here. There is no royal road to fruit growing: but the experience of others will help you, and practical knowledge makes perfect.

Regarding Apples, Pears, Peaches, Nectarines, Plums, Grape Vines and Berried fruit, which are from imported fruit, it may be remarked generally speaking, it is better to select the earlier ripening varieties, so that the fruit may escape the monsoon rains as much as possible. There are exceptions, but the rule is the earlier varieties do better in India.

If, again, selecting from late varieties, I would feel inclined to give the latest fruiting varieties the preference, if their fruit ripened after the rains.

Berries as a rule do not do well in India. Nuts are more successfully grown in the hills. The Walnut is indigenous, or has become so. The Spanish Chestnut and Filberts seem to do very well in some localities.

Amateurs should always bear in mind that fruit trees should not be allowed to carry more fruit than they can ripen off conveniently; if they are over-stocked with fruit, the result will be the crop will be small and poor in quality, or may be lost altogether. The trees will undoubtedly be weakened, if not only for the following year, for years to come, or may even die off. As an illustration of this, Peach trees are a good example. They bear profusely, and if allowed to do so, the fruit is useless; but the same trees with three-fourths or a larger portion of the crop taken off as soon as the buds set will yield splendid fruit. The same may be said of some varieties of Apples, and less so of Pears.

English Plum and Apricot trees seem to be capable of carrying more fruit without injury to the current crop than Peaches, Apples and Pears, but at the same time it is not advisable to tax the power of the trees to so great an extent, as it is certain to do injury in the long run, and wear them out eventually, much sooner than at all events were some portion of the crop thinned off.

This is a rational view, and put in practice will be found correct. Most fruit trees are benefited by pruning after Autumn has come to a close or when the sap has gone down. This is generally much neglected in India.

The native gardener considers his work done when he has planted the trees, and that even in a most indifferent way. The orchard thus gets woody and overgrown. Wood and foliage take away from the fruit the nourishment necessary to

it. The roots of fruit trees should be bared at the approach of winter, or the cold months in the plains, and the soil should be renewed with the addition of manure, after keeping the roots bared for a few days, to allow the trees to undergo an artificial wintering, or to allow the sap to run down to the roots.

Root-pruning is sometimes beneficial, but it cannot be done yearly, nor is it necessary. I strongly advocate, when it is done, that it be practised after the dry or hot months are passed and the rains are setting in, or after there is no danger of drought.

There is no doubt whatever that old worn-out trees, and trees that may not prove of satisfactory varieties, may be made use of for stocks to graft or bud on to. In such case the grafting or budding, or even inarching, may be done close down on the roots. When it is successfully done on the roots, the old tree can be cut down and only the root that supports the new growth may be left.

It may also be done higher up on the tree, but is not always so satisfactory.

For storing fruit precaution should always be taken that it is taken off with the foot stalk when possible, and also that it be not allowed to fall or get bruised in any way. The stage at which the fruit should be taken off for storing or for transit requires particular study and experience, which cannot be described on paper; it requires practical experience of varieties of fruit.

When fruit is stored away, it should not be huddled up in a heap, but be spread out on matting, on *mychans* or shelves, on wheat, barley or paddy straw, as thinly as space will admit, each fruit being separate from the next and not more than one fruit thick, that is, there should not be one layer of fruit on top of another. In transit, to be sure, this cannot be done, and necessarily one layer of fruit must be packed on top of another, and this engenders the heat which sometimes overripens the fruit before it arrives at its destination.

The varieties of fruit grown for commercial purposes require strict investigation, as some varieties stand carriage so much better than others. Such varieties as can stand carriage should only be grown when the orchard is planted for distant market purposes.

Certainly, when orchards are planted for fruit for home consumption or for local markets, there are many most excellent varieties which may be cultivated, which will not bear being packed for transit to distant markets.

Among such are Peaches, Nectarines, Plums, and many most excellent varieties of Apples and Pears, which need not be excluded from the orchard.

All these matters above referred to require most careful consideration in planting out the orchard.

Grapes have never had the attention that they should have had till quite lately; and its cultivation has yet barely gone beyond the experimental.

But good Grapes have been grown lately in Dehra Dun by continental experts, which shows that they can be cultivated successfully. In other parts of India, also, experiments have been made more or less successfully.

APRICOT.—*(Prunus Armenica.)*

Nat. ord., Drupaceæ.

This fruit in Mussoorie and other hill-stations of the North-West and Punjab Provinces is quite naturalised, or may be indigenous, and grows wild of an inferior variety and quality, and is known by the men under the name of "Sayoli" and by plainsmen as "Zurd Aloo." Nevertheless, this fruit makes an excellent preserve, jam or jelly, and is largely used for that purpose by native confectioners, especially in Mussoorie, where quantities of it is manufactured and sold to residents, as well as to clubs and messes in different parts of India, which points to what a thriving industry might be established in the preserving of fruit.

The finer varieties of Apricot grow to great perfection in the hill-stations of the North-West and Punjab, and when well cultivated bear excellent, well-flavoured fruit.

The Saharanpur Government Gardens can supply many of the best varieties, budded or grafted on suitable stocks, at the very cheap rate of 6 annas each.

It is best to prune Apricot trees and shorten all straggling branches on the approach of winter, when the sap has gone down; which will be in November or December, according to elevation. At the same time a trench should be dug round the roots and some of the old soil should be removed and replaced by manure.

Apricots sometimes bear fruit in the plains, but seldom if ever of good quality. In the hills it is produced freely at elevations of 2,000 feet and upwards.

When the fruit is swelling, a few applications or good drenchings of water will materially improve the produce both in size and flavour, if the variety is early fruiting and produced in the dry season. The later fruiting varieties are, I think, less suitable to India, as the wet season impairs their flavour and in other ways injures them, especially where there is a heavy rainfall. Varieties sold at Saharanpur Botanical Gardens are *Brussels*, *Cashmere*, *Early orange*, *Hemskirk*, *Kaisha*, *Large early*, *Mexican*, *Moor Park* (one of the best), *New large early*, *St. Ambrose*.

AVACADO PEAR, ALLIGATOR PEAR, OR SUBALTERN'S BREAD.—*(Persea Gratissima.)*

Nat. ord., Lauraecæ.

This is a moderate sized tree, with rather agreeable foliage, a native of South America or the West Indies, though now acclimatised to India. It bears fruit in August or September of the shape of a pear of large size, with a seed in the centre about the size of a large marble. Firminger says of the fleshy part of the fruit, it is "of the consistency of firm butter, and of the fine flavour of a fresh walnut; this eaten with salt is very delicious." I have only seen it eaten boiled with white sauce poured over it, in the same way as squash would be served up on table as vegetable, in which case it is no doubt very delicate and nice. It may be propagated by seeds, or by cuttings of half-ripened cuttings. It is suitable to the plains only.

AVERRHOA CAMBOLA.

Nat. ord., Oxalidacæ.

Vernacular name, KAMRANGA.

This is a handsome little tree of pyramidal growth, which has clusters of flowers of a rose color. A native of Molucca. It grows to about

the height of fifteen feet, or when old not exceeding twenty. The fruits are really very beautiful, of a waxy appearance, semi-transparent, of an amber yellow color, and delightfully scented when ripe. It is difficult to describe the shape of this fruit, further than to say it is deeply winged.

The fruit ripens in August, September and October in different localities, and bears again in January and February a second time. Though this fruit is too acid to be eaten as gathered from the tree, it makes a most delicious jelly, which is admirably suited for tarts, and other culinary purposes.

Propagated by seed most easily, it grows well in almost any soil, and is quite ornamental when planted where it can be well seen.

BALE FRUIT.—(*Ægele Marmelos.*)

Vernacular name, BEL PHUL.

This is a fruit which, leaving alone its medicinal virtues, makes a very agreeable sherbet. The finest I have seen were obtained at a village called Pugra, near the Dalsing Sarai Indigo Concern, in Tirhoot. These were very large, of excellent flavour, and had but few seeds in them in comparison to many I have seen. The best method of propagation is by layering, though it is often cultivated by seed, in which case it takes many years before it bears any fruit.

CAPE GOOSEBERRY.

Nat. ord., Solanaceæ.

Vernacular name, TIPAREE.

A small sprawling herbaceous annual, easily raised from seed and often comes up self-sown when it has once been planted; when ripe the fruit is of an amber color, of the size of a marble covered in a leaf-like envelope, which dries as the fruit ripens within. It is an excellent dessert fruit: but best, I think, as a jam, which no English jam surpasses, when the former is properly prepared.

Sow seeds in seed-beds in May or June, both in the plains and hills, and transplant when large enough to handle, at two feet apart. Nip the leading shoots to prevent them growing too straggling.

CARISSA CARANDAS AND CARISSA CHINENSIS.

Nat. ord., Apolynaceæ.

Native name, KURONDA.

The former bear purple, the latter pinkish fruit, both of a waxy appearance. This is more a sprawling shrub than a tree, from which, when wounded, a milky juice exudes. The fruit makes a very good jelly.

CHERRY.—*(Cerasus Caprioniana.)*

Nat. ord., Drupaceæ.

The cultivation of the Cherry has never met with any success in the plains, but it does very well in the hills at an elevation above 3,000 feet.

The wild Cherry of the Himalayas, of which there are several varieties, when ripe is of a very dark blackish red and sweet in flavour. Not unfrequently the bloom appears very early in the season, is nipped by frost, and falls off. This too occurs with the fruit.

The fruit has little pulp, and is therefore chiefly used for making Cherry brandy of a very good and superior quality.

Of the cultivated Cherry there are a great many excellent varieties of the light yellow, black and red descriptions.

A rather light well-drained soil suits it best. Beyond very slight pruning in summer, thinning out the branches, and manuring, it requires little care except protecting it from frost, as all of the varieties are more or less early flowering. *C. Caprioniana* is the common Cherry. *Early varieties* are the *Black Bohemian*, fruit black. *Buttners Black Heart*, *Buttners yellow*, *Downton*, yellow. *Elton*, one of the best, pale yellow. *Frogmore early*, red. *Gascoigne's Heart* or *Bleeding Heart*, red, one of the best. *Governor Wood*, light red. *Jaboulay*, red. *Napoleon*, very early, very large, pale yellow. *Black-eagle*, medium early. *Early Rivers*, large early, black.

Late varieties.

Late Black, *Late Amber Gean* and *Late Purple Gean.*

The Dukes or May Dukes, of which there are several varieties, are slightly acid, but are used largely for cooking purposes, for which they are much preferred.

Morello and Kentish Cherries.

These are more acid than the Dukes and May Dukes, but are largely used for cooking and making Cherry brandy. *Kentish* and *Flemish*, which are much alike, and red. *Morello*, nearly black, rather acid. *Ostheim*, larger than the last named and not so acid. *Weeping Morello*, the same as *Morello*, but the tree has a pendulous habit.

The greatest difficulty is to protect the bloom from frost by putting matting over the trees.

THE CITRON.—*(Citrus Medica.)*

There are about three or four different varieties of Citron known in this country. One is of enormous size, the second smaller, a third, which is of irregular form, called the Fingered Citron, and a fourth smaller

than the second variety, which probably may be only that variety degenerated or reduced in size by differences in soil and cultivation.

Propagated by grafting on the Pumelo it is a handsome object, with its fruit well raised from the ground, on which it will trail if propagated by grafting on the lime or by layering, in which case the fruits require to be supported to keep them from getting tarnished by contact with the soil. These plants bear heavily, sometimes so much so that branches break off by the weight of fruits on the trees if not supported.

They are most ornamental trees, and no fruit garden would be complete without them. The rind of this fruit, which is very thick, makes an excellent preserve after being immersed in brine or butter milk for a couple of days, to remove the bitter flavour to a certain extent: it is also candied, and is thus named Candied Lemon Peel. The leaves of this tree have no winged foot stalk, like others of the Citrus genus, and can, therefore, be easily distinguished from the larger varieties of lemon, for which they may be mistaken by amateurs.

CUSTARD APPLE.—(*Anona aquamosa.*)

Nat. ord., Anonaceæ.

Vernacular name, SURIPA or SURIFA.

In many parts of India this tree or rather shrub may be found growing in a wild state, though some point it out as being a native of tropical America. It is much improved, however, by cultivation, when its fruits are often as large as a cricket ball, with a roughish yellow-green exterior; its interior being filled with a custard-like pulp covering numerous black hard seeds.

This tree grows rapidly from seeds: however, I would fancy it would be much improved by grafting on seedlings of the Bullocks' Heart (*sweet sop* or *anona reticulata*), or on its own seedlings.

THE DATE PALM.—(*Phœnix-dactylifera.*)

Nat. ord., Palmaceæ.

Vernacular name, KHAJUR.

Little can be said of the Date Palm (*Phœnix sylvestris*, or *Dactylifera*, which are probably identical) further than remarking that as dessert fruit the same are worthless, chiefly consisting of stone and very little of pulp or outer edible substance. These trees are chiefly used for tapping for their sap, which is converted into sugar, or drunk by natives as a sherbet before fermentation sets in, or after fermentation as an intoxicating liquor. The finer varieties introduced by Dr. Bonavia are, I believe, in some instances yielding fruit, and has been fairly successful in some

localities, though I fear the cultivation of the same will only end in failure in Lower Bengal and Behar, owing to unsuitability of climate and excessive rainfall.

DATE PLUM.—*(Diospyros.)*

Nat. ord., Ebenaceæ.

Vernacular name, BELATEE GAB.

Not much is known about these Plums in India, of which there are many Japanese varieties, some of which have been grown in the hill-stations of the North-West and Punjab, and Darjeeling at Kurseong.

The fruit is said to be delicious.

In some of the varieties at least the fruit will not ripen on the tree, and in such case is put into earthen vessels and buried till ripe.

D. Kaki bears an eight-celled fruit which is fleshy and about the size of a small orange, yellow when ripe and pleasant to taste.

The plants should be planted in a sunny position, and require a moderately rich rather light soil.

In China and Japan there are a great many varieties which bear fruit of totally different flavour. Some of these have been imported to India. These fruit trees are not suited to the plains. They are most ornamental, and if for no other purpose would be useful. Propagated by cuttings of half ripened wood placed in sand with some bottom heat.

FIG.—*(Ficus Carica.)*

Nat. ord., Moraceæ.

Vernacular name, UNJEER.

There were but two or three varieties of the Fig to be found in India, till of late years, which bear good fruit. The Fig is most easily propagated by cuttings placed in shade, and watered at regular intervals when necessary. I believe that were the fruit protected when ripening from the direct rays of the sun by paper or linen bags it would tend to secure better results; as also were they grown in large tubs and protected thus by being removed during heavy rains, which causes too luxuriant foliage and growth. I have seen very good figs grown in the hills in an open garden without much care bestowed on them.

No doubt they would have been better, if cultivated with more care. The soil they are grown in should not be too rich, for, if so, the tree will not bear fruit. For cultivation, I would recommend the *Brown Turkey, Brunswick* and *Black Ischia*, which can be procured from the Saharanpur Government gardens. Get rid of all unnecessary growth by disbudding, and stop all unnecessary length of shoots by pinching off the

tips. *This stopping is very important when the fruits are swelling to induce its ripening*, and also to cause the wood to harden for the formation of fruit for the ensuing season, and should be done by the close of the rains and till the rains are over. Water copiously when the fruits are swelling. I have found the Fig quite hardy in the hills.

GRANADILLA.—*(Passiflora.)*

Nat. ord., Passifloraceæ.

Of the Passiflora, there are several varieties which bear edible fruit, though none, I consider, are of much worth.

They have an acid flavour, rather grateful to the taste when some sugar is added to them to do away with the excess of acidity; but they are full of seeds. In hill-stations the purple-fruited Granadilla may be seen in many gardens *(Passiflora Edulis)*. The plant is a most extensive creeper, and requires a large trellis for its support. The fruits are about the size of a large fowl's egg, of oval form, green at first, but purple when ripe.

GRAPE.—*(Vetis vinefera.)*

Nat. ord., Vitaceæ.

Vernacular name, UNGOOR.

Numerous varieties of the Grape Vine have been introduced into this country, with more or less success, according to the locality they have been taken to, the care bestowed on them, and the varieties selected.

Cuttings may easily be procured from England or the Continent by the overland route. These cuttings should be of semi-ripe wood, and should have their ends well covered with wax; they should then be packed in moss, and over all covered with paper, then wax-cloth. On receipt the lower end should be cut afresh, and the cuttings planted in boxes of light soil well drained, and when well rooted be planted out. After the rains are over, the roots should be bared and some good well manured soil should be put in to replace what has been removed. Firminger recommends oil cake *(khurree)* boiled, mixed with an equal quantity of molasses *(goor)* and a small quantity of lime. This being prepared is thrown into a hole dug for the purpose, and mixed with a considerable quantity of fresh cow-dung. The hole is then covered up for a month or two, and only opened up occasionally to stir up the contents. This mixture is added to the earth placed in the trench dug round each plant. When the fruit sets the plants should be watered copiously, and discontinued when the fruit has begun to attain its full size and ripen.

The fertilizers made specially for vines are as good as any mixture of manures that can be made, and should be applied as directed on the tins

or bags in which they are sold, and I think will generally give the best results that can be attained, provided the plants are *well* watered when the fruit begins to form up to the time the grapes begin to ripen, when water should be withheld.

Baring the roots in winter I think beneficial, after which the vines should be pruned, so as to induce them to yield a crop in the warm and sunny months of the season. Therefore the early fruiting kinds I think preferable.

On pruning the Grape Vine in this country it will be necessary to use the knife freely. Not more than one or two eyes of the past season's growth should be left of the old wood, and all the twiggy growth should be cut off entirely.

Imported cuttings will strike best in the rains or at the close of the rains. They should be watered lightly at first. The cuttings should be put in slanting-wise, and the soil, which should be of a light nature, well pressed down firmly around them. Shade carefully till they have taken root and thrown out shoots, after which expose gradually to sun.

Layering and cuttings of plants that are acclimatised may be taken at almost any season of the year, in the plains; but the rains, and about the close of the rains, is the best time for propagation. One-half to two-thirds of the length of the cuttings should be buried in the soil when planting cuttings.

When the fruits have begun forming and appear too thick in the clusters they should be thinned out with scissors: this operation requires judgment, in which experience only can be the best guide, and you must buy your experience, as many have done before you, sometimes more dearly than might have been expected.

Good varieties are the *Early Black*, *Black Hamburgh*, *Miller's Burgundy* (which has a white downy leaf), *White Sweet-water*, *White Muscadine*, *White Frontignan*. *The cannon Mill*, *Muscat of Alexandria*, and *West's St. Peter* are varieties that are cultivated in hot-houses, and are most likely to succeed best with those that try them in the plains. The early varieties when obtainable are undoubtedly the best for cultivation in India, such as would escape the rains.

GUAVA.—*(Psidium Guajava.)*

Nat. ord., *Myrtaceæ.*

Vernacular name, SUFREEAM, LUTAM AND AMROOT.

A small tree of not very agreeable appearance, a native of South America, with roughish light green leaves. There are a great many varieties of this fruit. The Pear-shaped with smooth skin

and the Pear-shaped with rough skin, commonly called the *Kafree*, both of which grow to a large size. The Red Guava, which is red inside, bears a smaller fruit.

These I may say are the best sorts and are excellent as dessert fruit; leave alone their being made into one of the finest jellies made from any fruit that are known. Indian Gooseberry and Guava jelly is famed now in all parts of England.

The trees require little or no care, though, no doubt, they improve by manuring; they require no pruning and bear two crops during the year in the plains of India, one in the cold season (when the fruit is best and most flavoury) and again in the rains.

In the hills I have had the above varieties growing well and ripening one crop of most deliciously flavoury fruit (at an elevation of 3,600 feet) in the month of October. *Psidium Punulum* is a small tree, with very small leaves and very small fruit, almost, I may say, worthless, as are many other varieties I have not thought worth mentioning. I should advise all those who care to have really good Guavas to propagate them by grafting (inarching) or layering. No doubt they may be propagated by seed, but they do not come true; the fruit seems always to grow smaller, and the trees thus produced take longer to bear.

HOG PLUM.—*(Sapondias Mangifera.)*

Nat. ord., Anacardaceæ.

Vernacular name, AMRA.

I only mention this tree, as the fruit is useful for putting into lentil (or *dall*) in cooking, as well as in curries, for the acid flavour which it imparts to these preparations.

It is propagated by sowing seed. Its fruit ripens of a green color, mottled with yellow, in October or November.

INDIAN SORREL OR ROSELLE.—*(Hibiscus Sabdariffa.)*

Nat. ord., Malvaceæ.

Vernacular name, KUDRUM.

The sepals are the parts of this annual that are used for making jams and jellies from, after the flowers have faded and fallen off. There are two varieties, one red, the other white. March and April are about the months when the seeds should be sown, and then transplanted at about three or four feet in any ordinary good soil. The plants will grow to about four feet in height, and the sepals will be fit for gathering in October or November.

JAMUN.—*(Syzygium Jambolanum.)*

Nat. ord., Myrtaceæ.

This is a large tree, of which the timber is of considerable value for various purposes.

Its flowers are inconspicuous, and fruit about an inch to an inch and a half long, oval, and of a reddish purple color, the consistency of a plum.

There are three varieties of Jamun, the best of which is to be found in the North-West Provinces.

This tree is grown from seeds put down during the rains.

KUMQUAT OR OTAHEITE ORANGE.—*(Citrus Japonica.)*

Nat. ord., Aurantiaceæ.

This is a most ornamental small tree, which bears diminutive fruit most excellent for preserving, as many of our readers may know from the jars of Kumquat preserve they have tasted chiefly imported from China, the tree being a native of China. This plant has been imported into India. The soil in which it is grown should be the same as that Oranges are grown in, and it should always be grafted or budded.

THE LEMON.—*(Citrus Limonum.)*

Nat. ord., Aurantiaceæ.

Native name, KURNA NEMBO.

There are several varieties of the Lemon to be found in India, all useful for culinary purposes, besides being ornamental.

Though they may be raised from seed, they come into bearing much sooner when propagated by inarching, budding or layering.

The sorts commonly known are the English Burtons, and a much larger variety than those first mentioned, which is probably a native of this country.

LICHI.—*(Nephelium Lichi.)*

Nat. ord., Sapindaceæ.

Native name, LICHEE.

This is a very handsome bushy tree, which bears perhaps as delicious fruit as any in India or in any country on the globe.

The fruit is borne in large bunches in April or May: at first green, then most beautifully shaded with yellow, and bright rose red on the side facing the sun.

The trees, when laden with fruit, are objects of great beauty. The thin rind, which is rough, encloses a semi-opaque pulp, which is delicious.

Fruits of a good variety should only have seeds of a very small size, while inferior fruits contain large seeds and but little pulp, which is not unfrequently acid. These trees seem to thrive best in a rich sandy moist loam. In the cold season, in December, remove a couple of feet in depth of earth all round the stem, or more according to the size of the tree, and thus let it remain for two or three weeks, then return it well mixed with old cow-manure or refuse from the poultry-yard.

When the fruit is swelling *copious watering or flooding* does much good, and the fruit will be much improved. In North Bhaugulpore, Behar and Dehra Dun, N.-W. P., I have seen the finest Lichies that I have ever had the good fortune to see in India; and there the soil is of a light loamy nature, with lots of moisture at the warmest season not far from the surface of the soil. The tree is a native of China, but thrives well all over Bengal and Behar, and the North-West Provinces. The fruit does not seem to keep well, and is eaten in its perfection when taken fresh from the trees. After three or four days keeping a great deal of its fine flavour is lost; the rind loses all its beauty of coloring, and becomes a dusky brown. A good Lichi has lots of pulp and little stone, is slightly subacid, of a most delicate and rich flavour, and full of juice. Few fruit can be compared to this in excellence. Plants are propagated by layering or by *goothee*. When the variety of this fruit is good, to have it in perfection the trees must be well watered when the fruit is swelling up to the time it is ripening or showing color: or the best varieties fail to produce good plump fruit.

LIME.—*(Citrus Acida.)*

Nat. ord. Aurantiaceæ.

Vernacular name, NEEBO OR NEMBO.

The several varieties of Lime may be found thriving and bearing fruit luxuriantly throughout India in the plains, from Bengal to the North-West and to Ceylon. For culinary purposes they are extremely useful, as also for the most delicious sherbet that can be made from them during the hot weather, which is so refreshing. The juice freshly expressed from the fruit seems always the best; that preserved in bottles having more or less a medicated taste. There is an immense variety of this fruit to be found all over India, some varieties differing but little from others. Firminger mentions ten varieties, but there are many more. These are what he enumerates:—(1) "Patu," a small round fruit; (2) "Kaghuzee," perhaps the best, I think, of the form of a hen's egg, and when ripe of a lemon yellow: (3) "Cheena Gora," of the size of an orange with a thin skin and fine flavour; (4) "Kumarale," a very large fruit, of pale lemon color; (5) "Rungpore," (6) "Taba," (7) "Arabian," and two

other varieties of which he does not give the names. A variety much used is the Jamare Lime, about the size of an Orange, with rather a thick skin, but when ripe yielding an abundance of very well flavoured juice. Limes should be propagated by layering or budding. A great number of varieties have, I think, been produced from seed-grown plants; really hybrid varieties are quite accidental. Therefore we see quite intermediate varieties in form, size and acidity.

THE MANGO.—*(Mangifera India.)*

Nat. ord., Anacardiaceæ.

Vernacular name, AM.

Of the greatest importance is this fruit to a large class of natives, who for some months almost live entirely on it: add to which the sale of the fruit is the source of income to not a few. There are parts of India where large quantities of this fruit may be seen exported in bangy loads, boat loads, and by train to find a sale in our town markets.

In the *Englishman* paper of the 10th September 1887, an article, headed "Calcutta in the Fruit Season," makes some apt remarks, which are very correct, and shows of what importance the Mango is, when it says:—"Mangoes are kings of the streets and the hour," and truly "on office door steps, in corners of verandahs, abutting on the foot-path, in every coign of vantage possible, vendors of Mangoes have established themselves, and cry their merchandise." It may well be remarked there are Mangoes of many sorts—both bad and good, both acid and sweet: some stringy as mops of tow and redolent of turpentine; others luscious, sweet, and of the consistency of a firm "blancmange" as remarked by Firminger. The Mango tree will be found in every district in India, either in its wild or cultivated state. *No fruit known varies so much in flavour as the Mango may be safely said.* Some partaking of the taste of the Pineapple; others of the Guava, Apple, Pear or other fruit. I do not in the least question that it is the finest fruit in the world. Some may differ in this opinion; however, I doubt if they would, had they a fair chance of seeing and tasting all the finer varieties, of which only *some* of the fine sorts, and of those a very limited number, find their way to the markets of Calcutta and other large towns and cities. Many of the most excellent sorts are grown by the wealthier class of natives, who keep them for their own use, and for presentation, and these seldom, if ever, find their way to vendors, and when they do, the quantity is very limited.

Europeans especially are imposed upon by being told they are buying Bombay or Maldah Mangoes, when they may be purchasing only some

averagely good variety. I may safely say thousands on thousands of Mangoes are sold in Calcutta and other towns, as so-called Bombays or Maldahs, which have not the slightest pretension of being either: and thus annually people foreign to India, and who have not been long resident in this country, run away with a completely wrong idea of this really grand fruit.

There are so many varieties that I consider it far beyond my experience to enumerate them: though I have been at different times in some of the best Mango-growing districts in India, and I regret I have never ventured to enter on their nomenclature.

Independent of the difference of flavour in the many varieties of Mangoes we have in India, there are sorts that bear up to as late as September and even October, thus making them invaluable as a fruit both to the market, gardener and consumer, for what is of value to one is of value to the other.

The failure of a Mango crop to the populace of India is greatly felt, and many suffer greatly from it among natives, who realize a source of income through it. The poorest native during the mango season looks forward to a meal almost exclusively of Mango, and many of the richer class make a meal of Mangoes, rice and milk, however much the very idea may disgust a European sojourner in this country; but there are many tastes that are acquired, and this is one, of the natives of India. As much might they dread our taste for caviare, cheese, etc., etc., which are all acquired by habit, and would appear to them quite as disgusting as eating what we consider an obnoxious mixture of the subacid Mango, milk and rice. With all I consider the Mango a wholesome fruit, and I have no doubt medical authority would agree with me in this point, as long as the fruit were of not too acid a variety or exposed to the sun, and eaten in a heated state, while yet fermenting from the sun's rays playing directly on them, as they are sold by some road-side way, or otherwise washed in some dirty water in a ditch most handy to the vendor, who does not consider stagnant water inconvenient for his purposes.

Mangoes of the best descriptions have often a very flat, thin stone, which can easily be bent, and they have little or no fibre annexed to the stone worth speaking of; however, there are exceptions as regards the stone, though no good Mango should have an attachment of fibre to the stone in my opinion.

Several of the commoner sorts have a strong taste of turpentine, while the most of them are extremely acid, and have a pungent flavour, which is entirely foreign to the good varieties.

"I am quite aware that it is generally supposed that the Bombay as also the Maldah Mango are each of one description; natives of the places mentioned. Having been in the Maldah District, and also having seen and eaten the Mangoes, all of the best descriptions are named Maldahs; and I presume to say it is much the same with the Bombay Mango: that the best of the class from that District have been called Bombay Mangoes, as each of these localities have fine varieties of Mangoes, chiefly in the districts and localities, as a class which makes them noted throughout India. At all events their nomenclature seems to be in inextricable confusion, and no one seems to be aware of the origin of the immense number of varieties: let it be hoped Mr. Maries* will help us out of the difficulty, as no one is more fitted or able than he is to do so.

*Mr. Maries, formerly Head Gardener to the Raj Darbhanga, who has undertaken the nomenclature of the Mango, which is indeed a stupendous task, considering the immense number of so closely allied varieties.

Mangoes may be raised from seedlings, but, in so propagating them, there is little doubt that they deteriorate, *at least in size*, and come into bearing very much later than if they had been grafted (that is to say, inarched, which is the most common method of propagation). As the Superintendent of the Allahabad Public Gardens says, there is an increased yield and finer plants to be obtained by his method of inarching on seedlings of very young age: I would adopt that plan as one of the modes of propagation. The seedling used as a stock must be very young, and the seeds yet adhering to them. Next, the graft must be of semi-hardened wood, that is, on the growth of the previous year. These are the two essential points to be attended to, otherwise the process is exactly the same as in inarching commonly.

Propagation and different instructions regarding the same.

It is frequently considered any sort of seedling will suit the purpose of inarching on, *but a selection should be made for some definite purpose*; or, when no change is thought necessary in the fruit of the young plant to be formed, a seedling of the same variety as that to be grafted on should be used for the purpose of a stock. It is quite natural to suppose that, if an early yielding Mango were grafted on a seedling of a late yielding variety, it would have some marked effect *on the time the plant produced would fruit*. Also grafting on a seedling of an inferior, acid, or turpentine-flavoured Mango would be objectionable, as the fruit from the graft would be more or less affected. This should be impressed on the mind of all those that would have fine Mangoes through their own care in propagating.

In December the roots of trees in bearing should be exposed by removing some of the earth around them (according to the size of the tree, more or less can be removed). After a space of two or three weeks, add some good manure to fresh soil, refill the hollow to the level of the soil around, and when the fruits are swelling in April and May, flood or water copiously with water: or with liquid manure. This, however, can only be done when there are a few trees to attend to in a garden.

I will not attempt to classify the different varieties of Mangoes; I leave so stupendous an undertaking to those who are more qualified to enter upon such a task. Indeed, I may say to classify all the varieties grown in different parts of India, and give a description of each sort, would form in itself the subject for a large sized book much beyond the aim of this work. I therefore take the liberty of only quoting those that Mr. Firminger has mentioned, and add a few varieties that I know are good.

The Rev. Firminger says:—"The following are the kinds grown in the Calcutta Botanical Gardens:—

"1. *Alphonso.*—From the vicinity of Bombay; a Mango of high repute.

"2. *Arbuthnot.*—Of the merit of this I have no knowledge.

"3. *Bengalee.*—An ordinary kind, of little value, I believe.

"4. *China.*—A small fruit, of little merit; remarkable principally for the tree bearing a second crop in October.

"5. *Gopâl Bhôg.*—From Maldah; in high estimation; of moderate size, of a deep amber and orange colour when ripe, the flesh of livery consistency, of peculiar flavour.

"6. *Kysapatee.*—From Maldah: a small fruit of rich exquisite flavour.

"7. *Langera.*—An excessively large fruit, of inferior quality. It remains upon the tree and ripens a month or more after the season of other kinds is past. Probably this is the one described by Dr. Lindley under the name of *Dodol* or *Calappa* as 'the largest variety, sometimes being as big as an infant's head, or middling Shaddock, weighing more than two pounds; called in Goa, *Barera.*'* I have also tasted a fruit of the same name which is sold in Calcutta, which is very fine flavoured.

"8. *Large Maldah.*—A middling-sized fruit, of an olive-green colour when ripe, the interior of a deep orange colour, about the finest, if not

* 'Transactions of the London Horticultural Society,' Vol. V, p. 113. There must be I think some mistake here, as the mango now sold as the *Langera* is a superior fruit.

the very finest of all. To those who have not partaken of it, no words can convey an idea of the merit of this exquisitely luscious fruit. It comes into season about the 20th of May. The Botanical Gardens are rather rich in the number of trees of this kind they contain.

"9. *Morshedabad.*—I am unacquainted with.

"10. *Peter.*—A moderate-sized Mango, of roundish form with a projecting heel on one side. It ripens of a dull russet colour with a reddish tinge, and may fairly be considered of first-rate merit, having a distinct taste of a ripe Gooseberry.

"11. *Singapore.*—A fruit of the largest size, ripening all over of an uniform greenish golden yellow; accounted by some a first-rate sort, but in my estimation of but secondary merit.

"12. *Soondershaw.*—A large fruit, when ripe very gorgeous in colour, of bright orange and vermilion; in flavour only as second-rate fruit at best; those produced in the Botanical Gardens are not even that."

The following are the several kinds grown for distribution in the Gardens of the Agri-Horticultural Society:—

"1. *Bangalore.*

"2. *Goa.*—A fruit of no high merit.

"3. *Bombay.*—This fruit is without doubt identical with the Large Maldah of the Calcutta Botanical Gardens already described.

"4. *Madras* (so called from having been introduced thence, but originally from Bombay).—A moderate-sized fruit, ripens of a straw colour, and is of very fine flavour.

"5. *Maldah.*—The same as Bombay.

"6. *Gopâl Bhôg.*—Already described.

"7. *Bindobunnee.*—A small egg-formed fruit of fine flavour: green when ripe.

"8. *Chuckchukeea* (from Maldah).—A fair fruit, but of no high merit.

"9. *Bhutoora.*—A small fruit of long and flattened form, ripens of a dark-green with vivid red streaks on the sunny side; the interior of a straw color, very delicious, having a spice of aniseed in its flavour.

"10. *Feroghabunnee* (from Maldah).—A very large fruit, seemingly of no great merit, possibly the locality being unfavourable for it.

"11. *Arracan.*—A small valueless fruit, of turpentine flavour.

"12. *Soondershaw.*—Before described.

"13. *DeCruze's Favourite.*—A Mango of moderate size; ripens of an orange colour; of ordinary merit.

"14. *Kysapatee.*—Already described.

"15. *Lucknow.*

"16. *Nagroo.*

"17. *Davee.*

"18. *Tarse* (from Mauritius).

"19. *August* (from Mauritius).

"20. *Madame* (from Mauritius). With the characters of these six last I am unacquainted."

The garden of Baboo Jibbon Kissen Paul, at Hooghly, contains a very choice selection of different kinds of Mango, of which, in addition to many already described, the following may be mentioned:—

"1. *Armân.*—A very large handsome fruit, in colour resembling a Nectarine, but in point of flavour of inferior merit.

"2. *Asmantârh.*—A second rate fruit.

"3. *Archaee* (Bombay).—A fruit of first-rate excellence, ripening some time after the season for other kinds is over. The tree which bears it is remarkable for the purple or inky colour of the young shoots.

"4. *Bêl Mango.*—A very peculiar and curious description of fruit, of a flavour in no way distinguishable from that of the fruit whose name it has; the leaf also of the tree has a strong parsley-like scent.

"5. *Bâtâvee.*—A moderate-sized fruit of first-rate excellence, when ripe of a pale apricot colour, the flesh of a pale-primrose colour; resembles closely in delicacy of flavour the "Madras" of the Agri-Horticultural Society's Gardens.

"6. *Bhooto.*—A large round fruit.

"7. *Bôgul.*—A very large cylindrical-formed fruit, of a pale-green colour when ripe, the flesh of a butter-like consistency and of a most delicious Apricot-like flavour.

"8. *Booree.*—A good ordinary country kind.

"9. *Chchâeton Moora.*—A good country kind.

"10. *Kuchchâee Meethea.*—A fruit remarkable for being sweet and eatable in its unripe state; eaten pared like an Apple.

"11. *Kala Puhâr.*—A first-rate fruit.

"12. *Kelooâ.*—A moderate-sized fruit of orange colour and fine Gooseberry flavour.

"13. *Kheera Chota* (Bombay).—A first-rate fruit.

"14. *Kôput Bunga.*—Of moderate size; in colour of a pale ashy-green, with a tinge of orange on the sunny side; a most delicious fruit, second only in merit to the Maldah.

"15. *Mohun Bhôg.*—A small red fruit of the very highest merit.

"16. *Mookh Muchee.*

"17. *Nâreèch* (Bombay).—A very large whitish-coloured fruit, ripens in August.

"18. *Pheeta Khâs.*—Flesh of a pale straw colour, very sweet and luscious.

"19. *Phreet* (Bombay).

"20. *Phoolee.*—A small fruit, red outside; flesh of primrose colour, of exquisite flavour.

"21. *Pyârô Khâs.*

"22. *Shah-Pusand.*—A very large fruit of a dull-green colour.

"23. *Soondâleea.*—A small green fruit.

"24. *Surees* or *Surees-Khâs.*—A long flat-formed fruit of moderate size; when ripe of a dark-green on one side with stripes of red on the sunny side; flesh of a deep orange colour, second only to Maldah in fineness of flavour.

"25. *Târâh.*—A fruit of moderate size, flesh orange-coloured; of a fine acid flavour." I may also mention the following varieties :—

26. *Sindoreа.*—A small fruit, with beautifully red and golden cheeks, of rather good flavour, though in some localities I have found them acid.

27. *Kalameа.*—A very long fruit, of yellow, sometimes green colour; of good flavour, with a peculiar long-nose shaped projection at the lower end of the fruit.

28. *Faijlee Bawa.*—An invaluable variety, being one of the latest bearing Mangoes. The flesh of this Mango is of a light primrose-yellow when ripe. The exterior of the fruit is green when ripe. I have seen this variety in Maldah, where I got some grafts of it. The fruit is of an immense size and rather roundish.

29. *Burburae.*—A small fruit, very minute, and rather worthless.

MULBERRY.

Nat. ord., Rubiaceæ.

Morus Multicaulus. Morus Indica. Morus Niger.

Morus Multicaulus and *Morus Indica* is a medium sized tree, and is to be seen growing in almost all parts of India.

It bears its fruit in February and March in the plains, but it is wanting in flavour, though it is sweet.

It is larger or smaller, and better or worse in quality, according to soil and climate. There are the black and the white varieties. *Morus Niger* is much superior to the last two mentioned and is the English Mulberry, but it is not to be seen except in hill-stations and Kashmir. It has been grown on the plains, but has not been known to my knowledge to have borne fruit at the lower elevations, and I am inclined to think that even at the higher altitudes the rainfall is too great for it to be grown to perfection.

All the varieties may be grown readily from cuttings put down at almost any time, but especially during the rains.

The Indian varieties *Morus Multicaulus* and *Morus Indica* are largely grown for feeding silk worms, wherever silk worms are reared.

NASEBERRY OR NESBERRY.

Nat. ord., Sapotaceæ.

Vernacular name, SAPOTA.

The fruit of this tree is excellent when taken off the tree when nearly ripe and stored in bran or sawdust till quite fit for the table.

The plants should be propagated by grafting on its own seedlings or *Mimusops Kauki* stocks. Seedlings take years to bear. The *Mimusops Kauki* is known to Natives under the name of Kirnee.

NECTARINE.—(*Amygdalus Persica.*) (*Var. Lævis.*)

Nat. ord., Drupaceæ.

The Nectarine does not succeed in the plains of India. It should be cultivated in the same manner as the Peach in the hills.

ORANGE.—(*Citrus Aurantiam.*)

Nat. ord., Aurantiaceæ.

Vernacular, NARUNGEE: Nepalese, SUNTALA.

Though the Orange is a native of India, there are certain localities in which it does not succeed, such as Lower Bengal and Behar. In Sylhet, Darjeeling and Sikkim it seems to thrive without much care.

The variety which comes from Sylhet, and is found in the Calcutta markets during the cold season, has a thin skin, and is of a lighter shade of color than that obtained at the same time from Darjeeling, and chiefly Sikkim, which has a thicker rind, which is of a deep orange, almost approaching red, when fully ripe. The latter, when not forced, I consider the sweetest. *C. Vulgaris* bears small fruit of a bright orange color half the size of an ordinary orange. This fruit is very acid, but is useful in making the best marmalade, and is, therefore, a useful and welcome addition, as well as an ornament to the fruit garden. The Orange should always be grafted or budded on such lime or citron seedlings which are of vigorous growth, though at the same time they do succeed on their own roots by being propagated from layerings. Firminger recommends Oranges to be budded or grafted on the sweet lime, which undoubtedly would make a good stock, but not so vigorous perhaps as many others. The Nagpore Orange is a good variety and is well known in the Calcutta market. Lime is an ingredient most necessary to the production of fruit of a good sort and quality, or of fruit at all; and I think is one of the chief reasons that the want of the same in the soil prevents its bearing fruit in the

alluvial soils of the Bengal Ganges Delta; though the climate to a certain extent, which has some effect, is detrimental.

To the soil that Orange plants are grown in I would not so much recommend high manuring only as the application of gooting lime well pounded to a fine powder, slaked lime and bone-dust, as well as a portion of charcoal. Good drainage is necessary in all cases. The trees should be well irrigated when the fruits are green, but withheld when ripening or changing color to orange.

The finer kinds of Oranges might with great success, I presume, be introduced to such localities as Sylhet, the North-West Provinces, lower elevations in Darjeeling and Sikkim, where Oranges now thrive with little care. These might be obtained from the Saharanpur Botanical Gardens, N.-W. P. The Orange tree is reputed for living to a great old age. It begins bearing at the age of about three years or frequently less, and at five years bears a most remunerative crop; after this its growth is slow, but it produces a large yield yearly. The cultivation of this fruit in the Himalayan Valleys would undoubtedly be most remunerative.

OTAHEITE APPLE.—*(Spondias Dulcis.)*

Nat. ord., Anacardiaceæ.

Vernacular name, BELATEE AMRA.

This is rather a handsome tree, of small size, with fine glossy leaves, which ripens its fruit about the months of March and April.

The fruit is very fragrant, of a fine old gold color when quite ripe, and of an oviform shape. The interior pulp is of a fleshy consistency, rather too acid for most palates. A good deal of the acidity goes off by gathering the fruit when ripe, then storing it for some time before use. The interior of the pulp contains a stone covered with a sort of thorny pubescence.

This plant is propagated by cuttings put down during the rains, or by grafting on its own seedlings, or on those of the Hog Plum *(Spondias Mangifera)*.

PAPAW.—*(Carica Papaya.)*

Nat. ord., Papayaceæ.

Vernacular name, PAPEYA.

This fruit is refreshing when sprinkled with sugar and scooped out of its rind with a spoon. I have seen the finest Papeyas grown in Chittagong of most excellent and varying flavour, perhaps due to the soil or variety of plant. This tree is always raised from seed, and is of exceedingly rapid growth. The fruit is borne close together and

should be thinned out. I fancy if more care was bestowed on the cultivation of this tree, it might be made to bear delicious fruit, and would recommend selection, transplanting and cultivation in good soil.

Some trees bear male flowers: these should not be cut down, as they add to the fruitfulness of the female trees in their vicinity. These trees cannot endure a hill climate.

PEACH.—(*Amagdalus Persica.*)

Nat. ord., Drupaceæ.

Vernacular name, AROO.

This delicious fruit can be cultivated in India with success in Upper Bengal, Behar and the North-West Provinces and hills of the North-West and Punjab. The sorts generally described as being grown are the Flat China, the Saharanpore and Calcutta Peaches, but European and American varieties have found their way to India at different times, many varieties of which can be grown successfully in the plains of India: while other varieties cannot be grown except at an altitude of over 3,000 feet above sea level.

I have no doubt that the best localities for growing the Peach in the plains of India are Western Behar and up to the extreme end of the North-West Provinces and Punjab, though there may be a few exceptional places where they will not grow so well as in these localities, owing to the soil being naturally unsuitable, as well as the climate, but even this can be remedied artificially through manuring and making the compost of a desirable nature. In Lower Bengal the Peach does not seem to do so well as higher up-country.

The Peach should be pruned in this country when it loses its leaf, or in November to the close of December both in the hills and plains, and then it should be cut back to five or six buds, but I do not think the trees should be pruned at all for two or three years or till they come into bearing. Further, to have good Peaches, when the fruit has formed they should be thinned out freely, as not unfrequently the trees are overburdened with fruit which fall off as they cannot ripen, or those produced are very small and worthless.

When young plants are pruned for the first time, the best plan is to cut them across flat on the top to a convenient height so as to form good broad low bushes. They are prone to grow tall and woody.

The Peach is best propagated by budding, then next best by inarching, and lastly by seed. At the time the trees are pruned the roots should be laid bare and occasionally root pruned and filled in again

with well manured soil. In the hills of the North-West Provinces the finer English and Continental varieties, *especially* the early bearing varieties, do very well at elevations over 2,000 feet and bear most excellent fruit of the finest quality. The late varieties do not ripen well and frequently fall off in the rains. A great many fine English and Continental varieties can be obtained from the Saharanpur Government Botanical Gardens.

PINEAPPLE.—*(Annassa Sativa.)*

Nat. ord., Bromeliaceæ.

Vernacular name, ANANAS.

The cultivation of the Pineapple is carried on with great success in Bengal, Behar and even considerably further up-country. In the Nepal Terai, Darjeeling Terai, the Dooars and Assam it thrives exceedingly well with little care, but are certainly much benefited by cultivation, though frequently this is much neglected. Many kinds of Pineapples which may be now found have been introduced, besides those which are probably indigenous to India, and which Firminger enumerates as: (1)—"*The Bengal.*"—A very good variety when well grown and fully exposed to the sun when cultivated; otherwise it is insipid and large, and of a pale yellow color. (2.)—"*The Ceylon.*"—The finest in flavour; fruit of rather a large size, light green when young, and deep orange when ripening in a sunny situation. (3.)—"*The Sylhet* or *Koomlah.*"—The fruit of smallish size, purplish when young, yellow when ripe. (4.)—"*The Dacca.*"—Described as also a fine fruit, remarkable for the smoothness of its rind and white color of its eyes. (5.)—"*The Penang.*"—Much like the Bengal kind, for which it might be mistaken. (6.)—"*Conical Crown.*"—Conical or sugar-loaf-like in form. (7.)—"*Striatifolia.*"—With variegated or striated foliage, marked red and white. (8.)—"*Cayenne*"—which Firminger says has not fruited in India.

In England the varieties called Queens and Providences are largely grown for the general crop, and Black Jamaicus and Black Antiquas for winter. I very much doubt if these two latter varieties would give satisfaction in the plains of India, though they would if grown in hill-stations, certainly under glass and with heat.

To produce good Pineapples, in the open ground especially, they must have a good sunny situation, and the atmosphere must be moderately charged with moisture. Drain your beds well, on top of which place turfs, over which place rich loamy compost, mixed with pieces of charcoal and brick of half an inch in size. Plant your Pineapples in August or September; manure moderately; too heavy manuring

causes the fruit to be larger and insipid. The fruit being insipid is sometimes due to too little sunshine.

PLANTAIN.—(*Musa.*)

Nat. ord., Musaceæ.

Vernacular, KELA.

The plantain is one of our most delicious Indian fruits. There are a very large variety of Plantains to be found in different parts of India, so much so that I consider it quite beyond the limits of the present small work to enter into this detail; nor is it necessary for our present purposes to mention more than a few of the best varieties and how to cultivate them generally.

The Plantain thrives admirably in a moist warm atmosphere, such as that of Lower Bengal, though it may be seen in almost all parts of India. The cold season is too great for its successful cultivation in the North-West Provinces. A wild variety of the Plantain may be seen growing at a great elevation in the hills, but these are quite worthless as far as fruits are concerned.

Plantain suckers should be planted out in the rains, in good rich soil; or soil well manured with old cowdung and some ashes. The suckers should not be planted nearer than 8 to 10 feet from each other, as on rooting they soon spread out as they multiply. Not more than four or five stems should be allowed to remain to each plant, and all suckers should be removed. When any one stem has borne fruit it should be removed as useless, for it will not bear again, and, in removing it, it should be cut well down to the roots to prevent the portion left decaying. When the fruit has formed to a certain extent, the flower will, as it were, grow away from those fruits that will mature, and should then be cut away, or by the flower being left it will take away a portion of the sap that would otherwise, on its removal, go towards the nourishment of the fruits.

On removing the flower, rub or sprinkle over the wound with dry earth to prevent its sap from escaping unnecessarily.

The *Champa* is a fine variety with a rare delicacy of flavour, and is only different from the *Chena-champa* in its being much larger.

The *Martiban* is also a fine fruit, much resembling in flavour the *Champa*. *The Daccâe* or *Daccâe Martiban* is a luscious fruit distinct from any of the others already mentioned. The fruit has a bloom over it occasionally, and the leaves and foot-stalks are coated with it. Fruit about four inches long and an inch-and-a-half broad, with a thick rind over it of a pale yellow color.

Mal-bhôg is by no means a bad fruit, though Firminger does not seem to think it better than the *Kuntela*, a coarse variety, of which the flowers are much used for cooking by Bengalies. The latter variety is an inferior fruit. The *Kutch-Kêla* and *Bag-nur* are varieties principally used for cooking, the fruit of which are of immense size.

Ram-kêla (or *Musa Rubra*) has fruit about 7 inches long, "first of a very dark red, ripens of a yellowish red." This is a delicious fruit.

(Musa Chinensis) Cavendish Plantain is a dwarf plant, bearing very large bunches, on which the fruits are about 10 inches long and ripen of a green color. I have grown this Plantain, and quite agree with Firminger when he says: "It is exceedingly difficult to obtain it in perfection, as it is uneatable till quite ripe, and, on its becoming ripe, commences almost immediately to decay." However, when obtained in perfection, this is a delicious Plantain.

PLUMS.—*(Prunus Domestica.)*

Nat. ord., Drupaceæ.

There are no less than fourteen varieties of country Plums sold at the Saharanpur Government Botanical Gardens, all of which are deserving attention as fruit which makes excellent preserve, and some of these are fairly good as dessert fruit, such as the Kabul Greengage, which is of excellent flavour.

The plum is not suited to profitable cultivation in the plains, where it seldom if ever bears fruit in sufficient quantities, but on the hills it is of the easiest cultivation and bears fruit in profusion.

The English varieties too bear well, especially the early varieties, but the late varieties, which ripen during the monsoons, not uncommonly suffer like the late English Peaches, and the fruit rot and fall off or are insipid and watery.

Pits should be dug for the reception of the plants and well prepared soil filled into them, composed of leaf-mould and old cowdung or old stable refuse, but not made too rich, which causes excessive production of leaf. When the plants have grown about five feet high or more they should be cut down at the season for pruning to the height of three to four feet, not more. That is, the central stem should be cut, which generally runs straight up.

This makes the trees more shrubby and not inconveniently tall. Plum trees bear chiefly on the spurs or small branches produced from the main stems. These may occasionally be thinned out in pruning, but it is generally best to leave them alone, unless too thickly situated

and interfering with one another. Ordinarily plum trees do not require much pruning, and this operation when necessary is best done in November or beginning of December, when the sap has gone down. Very little is necessary but to cut away straggling branches and keep the trees in as bushy and compact a form as possible.

The trees when in flower in March are very ornamental. At the time of pruning and when the weather is not too cold the earth round the trees should be removed and replaced with good manured soil. Root-pruning is occasionally advisable when the earth round the tree is removed.

Not uncommonly the crop of fruit which sets on these trees is a great deal larger than they can ripen properly, and should the whole crop be left on the fruit are miserably small and the vigour of the trees much taxed. It is therefore advisable to thin off the fruit very considerably, especially if dessert fruit are required, less so if the fruit are required for preserves.

Country varieties of Plums are very free bearing and are as good as any for the above purpose.

PUNEALA PLUM.—*(Flacourtia cataphracta.)*

Nat. ord., Flacourtiaceæ.

Vernacular name, PUNEALA.

This tree fruits about September or October, and bears several marble-shaped and sized berries of a greenish color, densely spotted and shaded with chocolate color. Eaten as taken off the tree, it is rubbed in the palm of the hand first, after which it is much sweeter. However, I do not think it is worth much in the way of a dessert fruit thus eaten, though it makes an excellent jam.

I believe the fruit of this tree might be much improved by cultivation.

This tree is covered with thorns, and may thus be known from the *Flacourtia inermis*, which has no thorns and larger leaves. The fruit too of the latter is inferior to the former.

LONG PLUM AND ROUND PLUM.

Nat. ord., Ramnaceæ.

Zizyphus Vulgaris or Kool Phul of the Natives.

Cool, crisp and juicy are the fruits of these plants when quite ripe: very agreeable to the palate, being somewhat sweet. Excellent dessert fruit when quite ripe, but often plucked too soon from the tree or not kept long enough before being put on the table. They are best when allowed to ripen well on the trees or when they are only kept a short time.

These trees are best propagated from grafts (inarching), or budding, as they often do not come true from seeds.

Zizyphus Jujuba or Narikelee Baer, Kool of the Natives.

This is a fruit which is so well known that it requires little description to any of the readers of this book who live in the plains of India. A very thorny tree that grows in almost every village. It is propagated from seed. The fruit of some varieties is excellent, while that of others is very acid. Some fruits are round, while others are more oval or oblong.

POMACEAE GENERALLY.

Cydonia Vulgaris. QUINCE, native name *Bihi.*

The Quince can only be recommended for cooking and preserves.

It bears fruit in the plains in some localities; but is more suited to the hills, where it thrives and bears fruit without much trouble bestowed on it.

The soil most suited to *Pomaceæ* is commonly met with in almost all, if not all the hills of the North-West Provinces and Punjab Hills, and is of a yellow colored or chocolate colored loam. Mr. Seers of the Snow View Gardens, Kumaon, Naini Tal, who has grown Apples and Pears of the very best varieties, and is, I would say, the best authority on English fruit in a hill climate, has in his most valuable articles dealt with them most ably in the pages of *Indian Gardening*, the only paper on gardening in India. He seems to be of the opinion that the fruit industry will at no distant period be a most valuable one; provided the correct varieties of Apples, Pears and other fruit are selected for commercial purposes, or such as will bear carriage well. Added to this it is a most important point there be facilities for transporting the produce of gardens to the plains, even such as small steam tramways.

That there are many places all along the Himalayan range where Apples and Pears can be grown most satisfactorily is now a well known fact, and no longer an experimental proceeding.

Eribotrya Japonica.—LOQUAT.

(*Loquat*, known by Europeans and Natives under this name)—Is an excellent fruit when well grown. It grows in clusters, and has a pretty waxy appearance, either deep apricot or primrose color; for there are two or more varieties.

The stones of the best sorts are small. These fruit trees require good cultivation, rich manuring, and watering *(copiously)* when their fruits are swelling. In the cold season the roots should be bared for two or three weeks, and the earth removed should be replaced by good *rich* well-made

compost. These trees should not be pruned at all. They are propagated by *goothee* or inarching on seedlings for stocks. The fruit is excellent as a dessert fruit, as also for making preserves; and are borne in March or April.

Pyrus malus. APPLE, native name *Seb.*

The Apple when first planted in such soil as is suitable to it as above described, yellow or chocolate colored loam, requires little or no attention, except perhaps watering in very dry hot weather, till it is necessary to prune its branches or its roots, and neither of these operations are necessary till the first year after planting. I strongly recommend the articles written by "Pomona" on Apple and Pear culture in *Indian Gardening* as being very correct. These articles may be found in the numbers of that journal for January, February, and March. "Pomona" recommends root-pruning to be done during the monsoons. Pruning the branches should be done in autumn on the approach of winter.

I need not enter here into the requirements of dessert kinds, fitted for commercial purposes, further than to say "Pomona" recommends those (1st) that have the ability to withstand the monsoons, (2nd) they should bear good solid heavy fruit, (3rd) a fruit that will have a tendency to toughen, not soften.

Among the early varieties he recommends the *Red Astrachan* and *Kerry Pippin* for commercial purposes. *Devonshire Quarrenden* and *Juneating* (red and white variety) and *Irish Peach* are more fitted for private gardens, as they will not bear being kept for any length of time. Among the second *Early King of Pippins* and *Ribstone Pippin* are recommended by "Pomona" as good commercial varieties, and among the third or main section *Coe's Orange Pippins, Adam's Pearmain* and *King of Tomkins County.* To be sure there are many other varieties very suitable for commercial purposes among the dessert varieties, but here is a selection made by a man of very great experience. Then among Cooking Apples he selects *Bismark* and *Rymer.* For private gardens there are many varieties that may be selected from a long list of varieties that may be procured from the Government Gardens at Saharanpur and Kumaon. Propagated by grafting on the crab or paradise stock.

Pyrus Communis. PEARS, native name *Nâspâti.*

The Pear does not generally bear on the plains of India, except perhaps only the country Pear, a variety very hard and woody, which is only good for cooking purposes. There are two varieties of Pears from Florida at Saharanpur which bear superior fruit there. The country Pear however is used as a stock to graft good varieties on, but

plants on this stock take a long time to bear. The Quince is perhaps the best stock for most deep stiff moisture retaining soils, while the English Pear stock is most suitable to sandy light shallow soils in warm situations; so "Pomona" writes, whose authority I think correct and indisputable.

Double grafting is practised, and also grafting on other varieties of Pears, for in the choice of its stock some varieties are especially fickle, are proportionally fruitful or otherwise affected in quality. These are points that can only be gained by experience and keen observation.

Pruning should, I think, always be done at the close of autumn.

1st. Early varieties: *Doyenne D' Ete, Bon Chretien, Jargonelle, Beurre D' Amaulis, Beurre Superfin.*

2nd. Midseason varieties: *Louise Bonne of Jersey, Beurre Hardy, Thomsons, Marie Louise, Marechal de la Cour* and *Beurre Boso.*

3rd. Late varieties: *Baronne De Mello, Doyenne Du Gomice, Duchesse D'Angouleme, Beurre D'Esperén, Beurre Diel Chaumontel, Winter Nelis, Josephine De Malines, Beurre Rane, Comte De Lany.*

Cooking Pears: *Uvedal's St. Germain, Catillac Vicar of Winkfield.*

In the planting of Apple and Pear trees (as well as all other trees in the orchard), it is well when putting them down first to have the pits dug for their reception some little time beforehand, and not on receipt of the plants, as I have often seen is the case, when the work is hurried through in a slip-shod manner and are neither deep nor broad enough.

Let the pits be say 4 feet in diameter by 4 feet deep, and remove all stones; prepare the soil carefully, add leaf-mould and some old manure sufficient only to make the same moderately rich, and fill in the pit, treading down the prepared soil firmly.

The distance at which you plant your trees will greatly depend on the mode in which you intend to train or grow your trees as bushes, pyramids, or espalier.

They should at all events be allowed lots of room, and it is better to err in giving too much space than too little.

PUMELO OR PUMPELNOSE.—(*Citrus decumana.*)

Nat. ord., Aurantiaceæ.

This is a very handsome small tree with fine glossy large foliage and pretty large orange-like flowers, very strongly scented, which attracts thousands of the insect tribe, especially in the morning and evening, when its odour is strongest.

It therefore should never be omitted from any garden of moderate size, as it is most decorative, first with its flowers, then with its fruits, which hang on it for a long time.

There are several varieties in India, I presume, from their difference in size of fruit and color of pulp, which is either of the color of a lemon or from pink to salmony rose, and much darker, almost crimson.

No doubt the size of the fruit and quality of the same is greatly influenced by climate and cultivation; but that there are several varieties I think remains quite indisputable.

They love moisture in the soil.

There are hybrids of the specified or named varieties, which I will not attempt to enumerate, produced by insects carrying the pollen, as natives frequently raise the plants from seed, regardless of the time it takes them to bear fruit; not from any scientific motive of improving the quality of the fruit! This applies to limes too; there are many hybrids intermediate in form and color and quality between the named varieties.

The fruit should be quite tender and juicy in pulp when they are of good varieties, well cultivated, and climatic influences are favourable.

The trees should be well watered when the fruit has set, especially in dry weather. Cultivation does a great deal towards the improvement of fruit.

In putting down young plants, pits should be dug for them 3 feet in diameter and 3 feet in depth, not less either way.

These should be filled with good compost, garden mould enriched with bone-dust, slaked lime, pounded brick and old cow manure, and a small quantity of salt. The soil round the plants or trees should be always kept dug up and free of weeds and not allowed to grow hard during dry weather and covered with weeds during the monsoons, nor with a pool of water around it.

The trees do not require pruning further than cutting away straggling branches to keep them in good shape till they grow old and woody, then they may be lopped and thinned out as necessary so as to renovate themselves. But generally speaking they do not deteriorate till old if carefully cultivated.

Every year in January or about that time the soil around the roots should be dug out according to the size of the tree from a few inches to a foot and a half or more, and the compost above mentioned should be applied, filling up the excavation and treading it down firmly.

When the fruit on the trees has set, water should be liberally supplied, in hot dry weather especially, but should be withheld when it is ripening or becoming of lighter color on the rind.

Firminger remarks it cannot be grown on the hills. I have seen it growing as high up as 2,500 feet on the Darjeeling hills at Teendharea, but I do not think it would succeed much higher than that, except in sheltered positions.

The Pumelo being a most wholesome and useful fruit, as well as being so ornamental, should never be omitted from any garden of even moderate dimensions, as I have stated before. Not only is the fruit useful, but the outer peal, including the white spongy substance below it, makes good candied peel and jam after first grating the rind off: it is then steeped for a couple of days in sour butter milk and salt, or in salt water alone. Then the butter milk and salt should be washed out of the rind, when it is ready to cook, with an equal weight of sugar or less according to taste. The steeping in butter milk or brine takes away the bitter sufficiently. In cool and cold weather in the hills the rind may be steeped for three days in either sour butter milk or brine. It is necessary in any case to grate the green side of the rind well first with a burnt brick (or *jhama*) or a nutmeg grater, or the bitter will be too great to be palatable. Add the juice of limes and some vanilla according to taste.

The cooking should be done on a brisk fire and the lime juice and vanilla or other flavouring added just before removing the jam from the fire on which it is cooking.

To make candied peel less sugar is necessary, and less cooking; so that the strips of peel remain whole. After cooking drain well, then sprinkle over well with candy and dry in the sun immediately.

POMEGRANATE.—(*Punica Granatum.*)

Nat. ord., Myrtaceæ.

The *desee* or native variety is of little good, though the Pātna kind is better: the best are mentioned by Firminger—as the *Shami* (Seyrian), almost stoneless and very large; the *Turki*, large white and fine in flavour; the *Misri*, with green rind and harsh flavour. Not much is known of the cultivation of the finer varieties. The flowers are of a bright scarlet color and much admired by natives, especially for their brilliancy.

RASPBERRY.

Nat. ord., Rosaceæ.

Rubus Indacus, the Raspberry, is indigenous to the hills of India; and *Rubus Albicans* is to be found in Mysore and Nilgiris, as well as the Himalayas. It is generally distributed over the European

Continent. They bear long shoots which are called canes in spring, and which in due course yield fruit in spring or summer. Some cultivated varieties bear their berries or fruit in Autumn.

The Raspberry should have all its old shoots or canes cut down to the level of the soil yearly, and the young growth of the following season is then allowed to bear its crop of berries, otherwise the nourishment afforded by the roots is consumed in the nourishment of the older growth.

Raspberries are propagated by seed and by suckers or offsets. The seed should be washed away from the pulp of the ripe fruit, dried and sown as soon as possible to secure germination. Sandy soil is the best to plant the seed in.

The best time for making new plantation of this plant is in October or November from division of the roots. For the cultivation of the garden or cultivated Raspberry the soil should be deeply trenched from 2½ feet to 3 feet and well manured. These trenches should be not less than five feet apart, and in the rows the plants should be not less than three feet from each other.

A rather moist soil suits them best. The fruit are borne from branchlets on the canes. In autumn a top-dressing of manure should be applied.

It is best to transplant Raspberries every third or fourth year, as the soil is soon impoverished in which they are cultivated.

The *American June Berry* AMELANCHIER, *Nat. ord. Rosaceæ*, TRIBE POMACEÆ, which is of many varieties, is easily cultivated in a good rich rather moist soil: near the bank of a water course or tank would be a good situation. It is propagated by cuttings or layerings in the rains or at the close of the rains. The best varieties are *A. Canadensis*, *A. C. Florida* and *A. Vulgaris*, which are known under different names.

THE BLACKBERRY, again, which belongs to the *Nat. ord. Ericaceæ* and is known as *Arctostaphylos*. These are grown in the hills with success, but do not bear so well as they do in Europe and the British Islands. They require little cultivation: for which see Arbutus. There are different varieties. *1 A. Alpina*, *2 A. Nitida*, *3 A. Pungens*, *4 A. Tomentosa*, *5 A. Uva-ursi*. Numbers 2 and 3 are Mexican, and 4 from North-West America. The others, numbers 1 and 5, are chiefly from Scotland. One variety is common to the hills in the North-West Provinces and Punjab.

The *Blackberry* again agrees in generic character with the *Arbutus*, but its fruit is five-celled and the cells one-seeded and not granular on the outside. They are not suited to the plains.

The ARBUTUS or *Strawberry tree* belongs to the *Nat. ord Ericaceæ.*

They are trees and shrubs, with leaves which are evergreen and laurel-like. The seed may be sown in sand in March in the hills.

They are not suited to the plains.

They may be propagated readily by layering, budding or inarching: but they are generally budded. The cultivation of the *Arbutus* would be much the same as most ornamental trees, but they grow best in a rich loam, freely mixed with leaf-mould, in a partially shaded situation, not under the drip of trees: on the north side of a hill or trees by which they are sheltered. One variety grows wild in the Himalayas which is certainly most ornamental.

A. Anedo, the Strawberry tree, of which there are several varieties, some bearing white flowers, others deep red. The fruit are large bright scarlet, granular and edible, much like the Strawberry in form. Height of tree about 10 to 15 feet.

Other varieties are ornamental trees for their flowers and fine foliage, of which *A. Andrache, A. Densiflora, A. Hybrida, A. Menzesi* are the best.

STAR APPLE.

Nat. ord., Sapotaceæ.

Not of much merit is this fruit, though the tree is handsome, as also are its flowers, of a greenish white color.

STRAWBERRY.—*(Fragrans Vesca.)*

Nat. ord., Rosaceæ.

Strawberries and Cream: the idea is delicious, eating them is more so, but neither the Strawberries nor the Cream are so good as they are at Home, in flavour: yet the Strawberries may be grown to be excellent in some localities in India, especially in the North-West Provinces. Patna, Cawnpore, Delhi, Agra, Saharanpur, Lucknow, Meerut, Dehra Dun, Kumaon and Mussoorie produce very good Strawberries. I have seen very good and well flavoured fruit in the Darjeeling District. However, none of these places will produce as good and well flavoured fruit as can be got in the British Islands or the Continent, nor are they nearly as large. The ground chosen for their growth should be well exposed to the sun, where the plants should be planted in holes prepared beforehand, filled carefully with well-prepared soil. These holes should be 10 inches apart from each other and a foot between

each row or more. Leaf-mould, cowdung and earth in equal parts should form the compost to fill the holes with. A good strong rich loam, in a rather moist situation, is the best for them. A stiff soil is unsuitable.

Between each third or fourth row leave a footpath, so as to be able to get at the plants to water them and weed the beds, etc. Remove runners not required for propagation. I have very rarely heard of them as non-productive; though that may occur in a dry season, if the plants are not sufficiently watered, cared for in keeping down weeds, and neglected in cultivation.

They should be planted in August, and for this purpose well rooted runners are used. Showery weather is the best for this operation. During dry weather they should be watered daily and should not be allowed to suffer from drought at any time, especially when the fruit is swelling.

Some people are very particular about the runners used for propagation, and rightly so. These as they appear are laid on small pieces of turf to take root, and when severed from the parent plant, the turf is taken up and planted in the position it has to occupy without any injury to the roots, which are liable to get bunched up in planting in the ordinary careless way by a native gardener.

When bearing the plants require to be covered with a net to save the fruits from birds. The best varieties can be left to the selection of any good nurseryman of repute in England, and can be got out in wooden cases or packed in moss. To save the fruit from being damaged by laying on the ground small earthenware plates, made in two halves, can be made by any country potter, to lay on each side of the plants, with a small bit cut out in the centre, to give space to the plant itself.

TAMARIND.—*(Tamarindus Indicus.)*

Nat. ord., Fabaceæ.

Vernacular name, IMLEE.

A most common tree all over the plains of India, of which it is a native. The fruits, which are bean-like, contained in a hard, crisp, thin shell, are ripe in February and March, and are useful for sauce and chutnee, mixing in chutnees, jams and jellies, and for making tamarind fish. It is also sometimes used for making a sherbet, which is cooling and agreeable when properly prepared.

I have only seen the sour fruited kind. Firminger mentions the sweet fruited and red fruited kinds, which I have not seen. These trees are raised from seed or from goothee.

WAMPEE.—*(Cookia-punctata.)*

Nat. ord., Aurantiaceæ.

The fruit of the Wampee is borne in clusters: is of a rather roughish texture, and is about the size of small marbles of a light yellow to almost orange color.

Within the somewhat shelly outer covering is a little pulp, the edible portion, in which is enclosed three seeds.

The tree grows from 15 to 20 feet in height and bears small inconspicuous white sweet-scented flowers.

In the plains of India this tree grows anywhere with little or no attention; but the fruit is much improved by manuring the tree and watering when the fruit is swelling, though at no time would it be considered of much value. The tree is propagated by seed or by cuttings in the rains.

EDIBLE NUTS.

AMYGDALUS COMMUNIS.—*Nat. ord., Drupaceæ.*

THE ALMOND.

Native name, BUDAM.

These have only succeeded up-country, where they grow without any particular care further than cracking the shell and planting the kernel where the plants are to grow in a good well-prepared soil. They do not bear transplanting well, having long tap roots.

ARACHIS HYPOGAEA.—*Nat. ord., Fobaceæ.*

Native name, CHEENA BUDAM.

Plant the legumes (or nuts as they are improperly called) in rows in a light soil and keep free of weeds. These require little care. The plants flower in June and at once, curious to say, place their own seed pods underground, where they mature. After the crops have been dug up, plant the legumes in a fresh spot, keeping what may be required for use in a dry store-room. These nuts should first be fried in butter before being used and should then be served up warm on table.

TERMINALIA CATAPPA.—*Nat. ord., Combretaceæ.*

INDIAN ALMOND.

Native name, DESEE BUDAM.

A tree with handsome foliage and horizontal branches, as if in layers. The foliage turns yellow and red towards the cold season, when it is

going to shed its leaves. Enveloped in a green husk may be found the narrow long kernel, which is of excellent flavour. This tree bears two crops during the year, once in May or June and the next in the cold season. Plant the kernels where the trees are to grow.

TRAPA BICORNIS.—*Nat. ord., Haloragaceæ.*

WATER CHESTNUT OR WATER CALTROPS.

Native name, SINGHARA.

This plant is to be seen growing in tanks all over Bengal in a wild state. The nuts are black or blackish-purple with two or three sharp points. These nuts are peeled and boiled or fried before eating.

In many parts of India the *Singhara* is cultivated by natives, who sell their produce in the bazaars.

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